# 231-TP-003-001

# Earth Observing System Distributed Information System Core System (ECS) Product Distribution System (PDS) Program Plan

## Technical Paper

## February 2001

Prepared Under Contract NAS5-60000

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# Abstract

This technical paper describes the program baseline for the Earth Observing System Distributed Information System Core System (ECS) Product Distribution System (PDS). The ECS PDS will provide enhanced physical media distribution capability at the EOSDIS DAACs.

***Keywords:*** Distribution, products, media, schedule, test, risk, hardware, network, EDAAC, ECS, PDS, GOTS, interface, integration

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# 1. Introduction

## 1.1 Purpose

This technical paper describes the program baseline for the development and deployment of the Earth Observing System Distributed Information System Core System (ECS) Product Distribution System (PDS). The ECS PDS will provide enhanced physical media distribution capability at the EOSDIS DAACs for the Drop 5B.06+ baseline.

This technical paper provide program plans and schedules to provide guidance in preparation of the detailed planning necessary to ensure a graceful transformation from the design and prototyping activities into a tangible item ready for system integration and test. This paper describes the ECS PDS acquisition lifecycle from ESDIS concept formulation through deployment to the DAACs.

## 1.2 Status and Schedule

This submittal supports the EDAAC ECS PDS program plan deliverable requirement in support of the NASA ESDIS and USGS EDAAC contract agreement.

## 1.3 Organization

This document is organized into six sections and six Appendices, in addition to this introductory material:

Section 2 Related Documentation, contains a list of documents which influence or embellish the material contained in the PDS Program Plan.

Section 3 ECS PDS Program Overview, provides a program overview for the ECS PDS program. The ECS PDS program overview is broken into 6 categories, which include a description of the ECS PDS program, an overview of the design components and interfaces, roles and responsibilities, hardware and integration requirements, operations concept, program schedule, and risk mitigation.

Section 4 ECS PDS Component Development, provides an overview of the ECS PDS component development process and describes the PDS GOTS development and test, PDSIS development and test, and the ECS interface and test.

Section 5 ECS PDS Integration and Test, describes how the ECS PDS development system will be tested prior to PSR. The ECS PDS will be tested via 1) hardware and COTS verification testing, 2) installation verification and system checkout, 3) interface verification in the VATC and at EDC, and 4) integrated development system testing and acceptance testing at EDAAC.

Section 6 ECS PDS Release Process, describes the ECS PDS deployment/release process including the Pre-Ship Review (PSR), installation, integration and test, training, turnover to the DAACs, sustainment, and follow-on options.

Abbreviations and Acronyms, contains a list and definition of abbreviations and acronyms used throughout this document.

ECS PDS Integrated Program Schedule, provides a copy of the details ECS PDS Program schedule.

Ticket: RM_5X_01 (Without L4 Mappings) DRAFT, provides the ESDIS requirements ticket for ECS PDS.

Product Distribution System (PDS) Procedures used by Level 1 Operations at EDC, is a draft procedure used by a current PDS system in a production environment to use as a reference point for the Operations procedures

ECS - PDS Integration for ECS, is a white paper used by ESDIS and ECS to discuss options with USGS EDAAC on 10/26/00.

ECS PDS Risk Mitigation Table is a compendium of ECS PDS program risk that will be tracked until program completion.

# 2. Related Documentation

## 2.1 Parent Documents

The parent document causing the need for this plan is the NASA ESDIS PDS SOW from which this PDS Program Plan's content has been derived.

## 2.2 Applicable Documents

The following documents are referenced within this PDS Program Plan, or are directly applicable, or contain policies or other directive matters that are binding upon the content of this volume.

| | |
|---|---|
| 230-TP-002 | Interface Control Document between the ECS and the Product Distribution System Information Server (PDSIS) |
| 423-41-58 | ICD between ECS and EDC |
| USGS/EDAAC_PDS-100 | Product Distribution System (PDS) Information Server (PDSIS) System Requirements Specification, December 2000 |
| USGS/EDC PDS-112 | Product Distribution System (PDS) Stand Alone System Requirements Specification, December 2000 |
| USGS/EDC PDS-203 | Interface Control Document Between the Product Distribution System Information Server (PDSIS) and the Product Distribution System (PDS), December 2000 |
| ESDIS Ticket: RM_5X_01 | Integration of the EDC Product Distribution System (PDS) with ECS |

## 2.3 Information Documents

### 2.3.1 Information Documents Referenced

The following documents are referenced herein and, amplify or clarify the information presented in this document. These documents are not binding on the content of the PDS Program Plan.

| | |
|---|---|
| 430-11-06-007-3 | Landsat 7 System Level 0R Product Output Files Data Format Control Book (DFCB), Volume 5, Book 1 |

USGS/EROS Data Center (EDC), L1-409, Level 1 Product Output Files Data Format Control Book (DFCB), Volume 5, Book 2, Revision 4, January 2000

Hierarchical Data Format – Earth Observing System DFCB <TBD>

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# 3. ECS PDS Program Overview

This section provides a program overview for the ECS PDS program. The ECS PDS program overview is broken into 6 categories, which include a description of the ECS PDS program, an overview of the design components and interfaces, roles and responsibilities, hardware and integration requirements, operations concept, program schedule, and risk mitigation.

## 3.1 Description

This section describes the approach that was selected for integrating the EDC Product Distribution System (PDS) with 5B ECS. The intent is to use the PDS for all hard media distributions (except D3) because the ECS upgrade for new media types is delayed. The ECS PDS will support all physical media distribution for ECS. The physical media types being supported by ECS under ECS PDS, at this time, are CD-ROM, DVD, High Density 8mm Tape, Digital Linear Tape.

The PDS is a development project that is managed for NASA ESDIS by USGS EDAAC. The ECS PDS development is being completed via Raytheon contracts; Raytheon C3I ECS contract with NASA Contract NAS5-60000 and Raytheon ITSS contract with USGS Contract USGS 1434-CR-97-CN-40274. The ECS PDS development program will provide operational systems to all EOSDIS DAACs and the ECS Development facility (EDF).

During a telephone conference between ESDIS, EDC, and ECS on 10/25/00, it was decided to pursue the option previously known as the ECS PDS FRONTEND option. Appendix E provides an ECS White Paper that discussed the design options at this time. The ECS PDS FRONTEND option is an interim solution that allows quick integration between ECS and a proven PDS. The FRONTENDED option means that PDS will be connected to the ECS by PDSIS running SDSRV acquires versus a fully integrated approach where PDS is considered to be integrated and is set up as an output distribution device; i.e., such as, the current ECS 8 mm distribution system.

The ECS PDS follow-on efforts maybe negotiated at a later date; however, at this point, the Raytheon C3I ECS contract is responsible for integrating and providing support and sustainment of the ECS PDS into ECS Drops 5B/6A/6B, with some limited technical support being provided through the USGS Raytheon contract until the end of FY01.

Some of the benefits to the ECS program due to ECS PDS are:

- Provides operationally proven media distribution support.
- Adds DVD media distribution.
- Provides Media QC before shipment.
- Provides Media labels (DAAC can tailor by data set).

- Provides Jewel box inserts for CD-R and DVD (DAAC can tailor by data set).
- Shipping labels are automatically generated.
- CD-R and DVD mass production from DAAC constructed masters is available.
- ECS PDS can increased media distribution capacity (depends on media types and cache access patterns).
- ECS PDS can support other DAAC elements.

## 3.2 Component Identification and Interfaces

The purpose of component identification and interfaces is to list all components necessary to build the ECS PDS System, and to characterize interfaces so that development and integration plans and schedules can be coordinated. The resulting components list from the three ECS PDS components are mapped into release-specific build/thread-oriented entities. These entities provide a logical, functional implementation and integration schedule for the PDS.

Component Identification began during the program concept phase, and development of the ECS PDS components is ongoing. The Configuration Item (CI), identified as ECS PDS, is broken down into components as described below, and the requirements/interfaces/hardware for those components have been defined in the documents described in Section 2 and in the following information in this section of the document. The component configuration item owner shall provide configuration control for that particular ECS PDS component. The EDAAC ECS PDS project lead will be responsible for tracking the ECS PDS components and associated documentation until the ECS PDS has been completed turnover at the DAACs (completion of the acceptance testing at each DAAC). EDC DAAC Configuration Control Board (CCB) configuration control board and EDC development configuration control boards will be responsible for PDS components other than ECS provided software during the ECS PDS development. At this time, the ECS program and the DAACs will be responsible for configuration control of the ECS PDS. . The configuration control of the ECS PDS will be the responsibility of ECS upon turnover to the DAACs. ECS will be responsible for configuration control of the ECS PDS hardware. Components are characterized as “Off-the-Shelf” (OTS), custom-developed software/hardware, or a combination of the two.

The ECS PDS consists of 4 components:

1.) **PDS Input Server (PDSIS)** is an input server being developed to provide the interface between ECS and PDS-SA in accordance with the ICDs and specifications referenced in Section 2. PDSIS is being developed by USGS EDAAC,

2.) **PDS-Stand Alone (PDS-SA)**, which is also called **PDS GOTS**, for “Government off the shelf”. This component is being packaged by USGS,

3.) **ECS subsystem interfaces** required to support the ECS PDS program including PDSIS and PDS-SA are being done via Raytheon ECS in Landover, MD, and

4.) **PDS Hardware Acquisition and Layout** is also the responsibility of Raytheon ECS in Landover, MD.

### 3.2.1 PDS Input Server (PDSIS)

The PDS Input Server (PDSIS) is a centralized, focused resource for the distribution management of digital products. It receives the customer's order information from the appropriate input source, interfaces with ECS to retrieve data for the products to be created, passes the production parameters to the Product Distribution System (PDS) and creates relevant shipping materials for shipment. The PDSIS is the interface between the ECS and the PDS GOTS. The PDSIS includes the following components:

- Server Component Coding and Set-up
  - ODL Parser component
  - Database Set-up
  - Acquire Product component
  - Email Parser component
  - Staging Disk Clean Up
  - Shipping Label Component
  - MSS Status component
  - PDSIS GUI Manager (error/recovery)
- Documentation and Testing
  - Define Requirements for Product Modules
  - Development of an Interface Simulator for testing
  - Code Integration and Test with simulator
  - Software Packaging & Documentation
  - Requirements CD Label
  - Requirements CD Insert
  - Requirements for Tape Labels

The PDSIS has requirements to support the following capabilities:

- Accepting multiple digital product requests via V0GW ODL.
- Requesting digital product data from ECS via a product request parameter file.
- Receiving digital product data from ECS and PDS-SA via email and ftppush.

- Maintain ECS order tracking status.
- Coordinating PDS-SA processing to include detection and resolution of data transfer problems, data flow control, and order recovery.
- Generating packaging and shipping artifacts including packing lists and shipping labels.
- Managing PDSIS processing such as accepting Operator Processing Requests managing PDSIS data, generating Production Reports, monitoring PDSIS operations, and manage PDSIS Jobs.
- Provide temporary storage for 438 GB of digital data, and to provide a throughput production capability in a 24-hour time period equivalent to 535 GB of digital data dependent.
- Can be operated within the ECS and provide 24 hours per day, 7days per week continuous operations with in ECS with an operational availability of 0.96 and a mean-time-to-restore (MTTR) capability of 12 hours.
- PDSIS will support future growth capability in processing and media output types.

Detailed requirements are discussed in the PDSIS reference document listed in section 2.

Below is an illustration of the PDS Information Server processing flow:

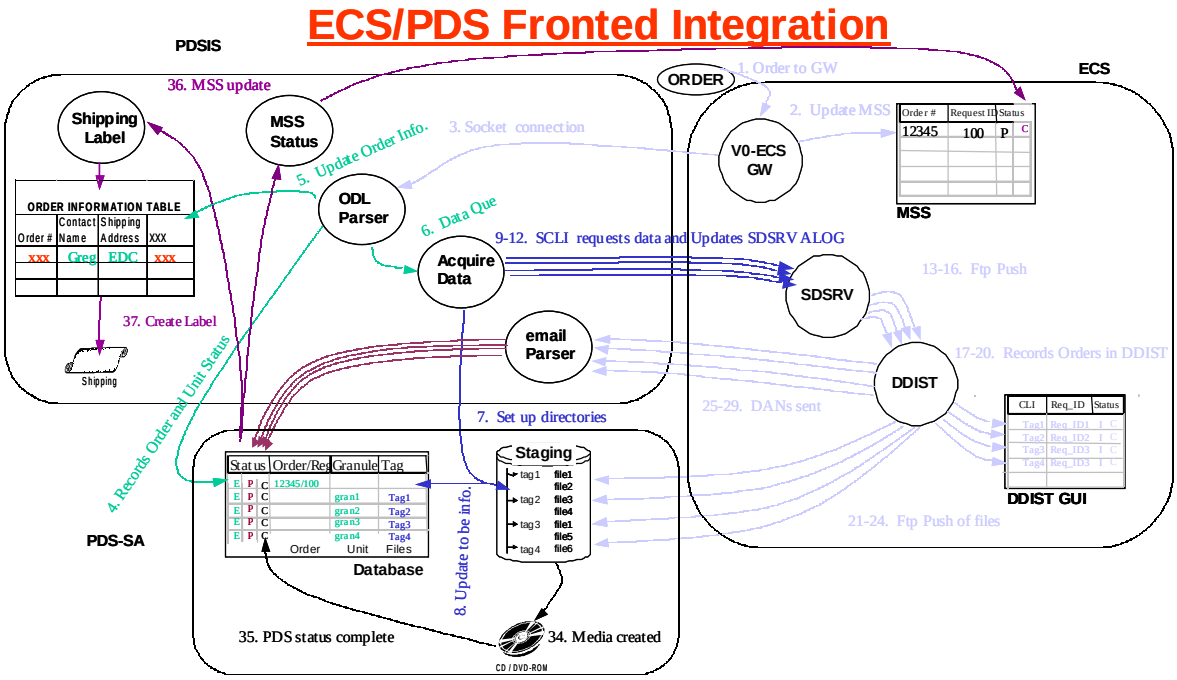



***Figure 3-1. PDSIS Processing Flow***

### 3.2.2 PDS GOTS

The PDS Stand Alone (PDS-SA) is a centralized, focused resource for the distribution of digital products. It interfaces with the PDSIS to retrieve information about the products to be created, retrieves the customer's data from the appropriate input source, assembles it into a useful form, and creates output media suitable for shipment.

Below is an illustration of the PDS Stand Alone processing flow:

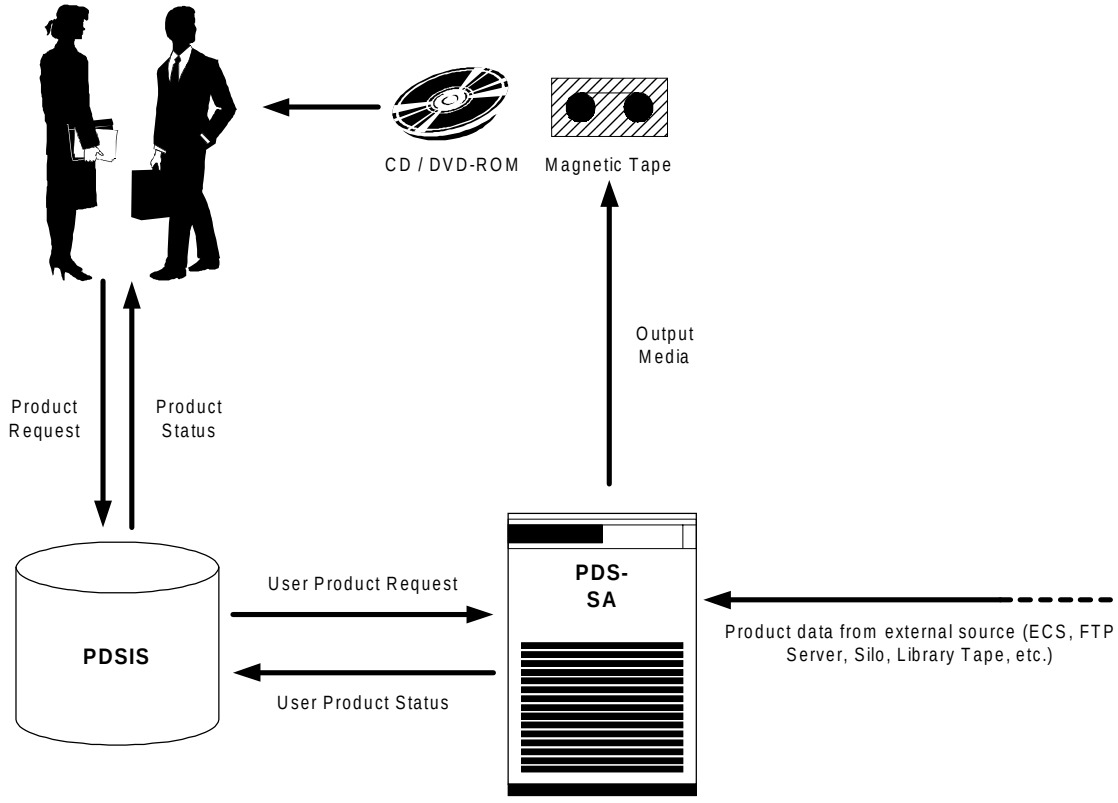



***Figure 3-2. PDS Stand Alone Processing Flow***

The PDS-SA shall provide capability in the following areas:

1) Acquire Digital Products from disk, resolve and detect data transfer problems, and re-pull data.
2) Generate and distribute Digital Products to customers via the following media types: CD-R, DVD-R, High Density 8mm Tape, Digital Linear Tape 7000c.
3) Label CD-R and DVD-R and print jewel case labels.
4) Provide production and verification notification that a digital product has been produced and verified, and then remove associated digital product files.

5) Manage PDS-SA Processing including Accept Operator Processing Requests, Manage PDS-SA Data, and Generate Production Reports.

6) Manage PDS-SA Operations including operator system interfaces and job management capabilities. This included system control, job management and tracking, error reporting, fault isolation support and recovery.

7) The PDS interface with the ECS shall be compliant with the PDSIS-PDSSA ICD See section 2 references. The PDS shall generate HDF EOS products that are compliant with relevant product specifications and data format control books, as appropriate, for each product line.

8) The PDS-SA shall be able to provide temporary storage for digital data allowing a production throughput capability in a 24-hour time period equivalent to 535 GB of digital data.

9) The PDS-SA shall provide the capability to support attended operations 24 hours per day, 7 days per week, on a continuous basis, and unattended, automatic processing 16 hours per day, 7 days per week, on a continuous basis, within ECS with an operational availability of 0.96 and a mean-time-to-restore (MTTR) capability of 12 hours.

10) PDS-SA will support future growth capability in processing and media output types.

Detailed requirements are discussed in the PDS-SA reference document listed in Section 2.

### 3.2.3 ECS PDS Interfaces

The ECS PDS integration is governed by the interface control documents define in Section 2 above. The following is a brief discussion of the interface between ECS and PDSIS/PDS-SA.

When the ECS-V0 Gateway receives an order, it separates 8mm tape, DLT, DVD-R and CD-R delivery requests from other delivery requests. All order requests are entered in the ECS order-tracking database. Deliveries of 8mm tape, DLT, DVD-ROM and CD-R are handled by the PDS (EDC Product Distribution System) through an interface with the PDSIS (Product Distribution System Information Server) in accordance with this specification. Other requests are forwarded to the ECS Science Data Server.

Figure 3-3 diagrams the data flows for the interface. The figure is limited to the physical media orders that are the subject of this specification, namely 8mm tape, DLT, DVD-R and CD-R. This specification uses the term "physical media" to mean these four delivery types.

If a physical media order is for other than Landsat-7 products (unshaded areas in the figure), the gateway forwards the order to the PDSIS. The interface is socket based and uses the same ODL message formats as the ECS-DORRAN interface. For Landsat-7 products, the V0 Gateway first forwards physical media orders to the DORRAN at EDC (see shaded area of figure); then when the Gateway receives a validated Product Request from DORRAN, it forwards the Landsat order

to the PDS. The V0 Gateway-DORRAN interface messages are documented in the ICD Between ECS and the EDC DAAC, ESDIS document number 423-41-58.

For each order it receives from the V0 Gateway, the PDSIS orders the requested data from the ECS using the SCLI, a command line interface with the ECS Science Data Server. The PDSIS may break up large orders into smaller sets and may elect to order granules for a request individually. Orders from the PDSIS do not include Request IDs and are not tracked in the ECS Order Tracking Database. ECS delivers the data to the PDSIS using its standard ftp push data distribution capability. It should be noted that granule level access control is not in effect for orders from the PDSIS, which is viewed as a privileged user.

The PDS fills the order and delivers it. The PDSIS sends an e-mail data distribution notice (order shipment notification) to the user. It then updates the ECS order-tracking database to completed status.

Operators may use the PDS operator interfaces to check on status of physical media requests and control the physical media distribution to users. ECS operator interfaces can be used to obtain status of PDSIS requests for data from ECS.

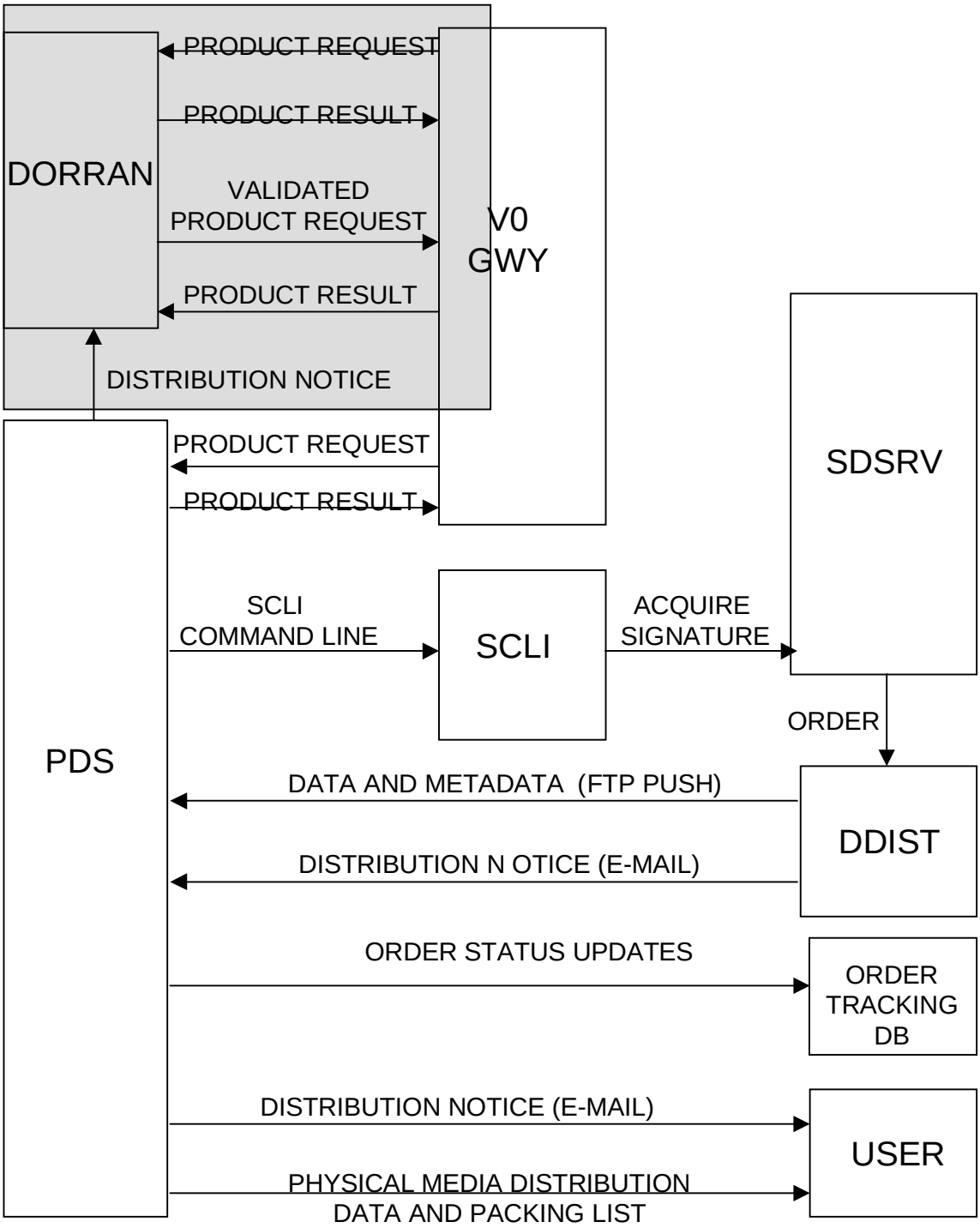



***Figure 3-3. Summary of Data Flows. Shaded area applies only to requests for Landsat-7 data. ECS creation of order tracking records is not shown.***

When the PDSIS determines that it has a product ready for generation on removable media, PDSIS notifies the PDS of the product's availability by inserting a record in the database table pdt_pdsinfo, residing within an Oracle database on the PDS machine. This record includes the product's location and the information needed for media generation (e.g., media type). Each record represents one of possibly several units in a single order, and each unit represents a single ECS granule. The PDS database will contain database tables needed only by the PDS software. Oracle Database version 8.0i and Oracle Forms version 4.5 will be used. All of the database tables for PDS use will be backed up and purged on a regular schedule.

A unit is initially placed in the PDS database table with a unit status of pending (Q). The PDS operator selects the next order to be processed in the PDS from the PDS display. Hardware status may affect the sequence in which orders are selected. Orders are normally processed on a first-in, first-out (FIFO) basis. The PDS can process multiple orders simultaneously. When the PDS operator activates an order, the PDS unit status is set to active (I), and the PDS pulls the corresponding product from the ECS defined storage location to the PDS disk space. If the product is to be placed on magnetic media, the PDS operator receives a tape mount request. The operator responds by mounting the tape and the selecting the tape drive to be used. The PDS then writes the product to the tape. Orders to be placed on compact disc recordable (CD-R) or Digital Versatile Disk (DVD) media will be mastered on the PDS host using the mkudffs utility and then passed to a Rimage system for media generation. The PDS automatically prints a label directly on the CD-R and prints a label for the PDS operator to insert into the CD-R jewel case or attach to the tape. The unit status is set to QC-Hold (F) upon completion of media generation.

After the tape or CD-R is generated, it is verified. To do this, the PDS operator removes the CD-R or DVD-R from the output bin or the tape from the tape drive where it was generated and loads the medium into a different drive. The PDS operator then invokes a utility that reads the entire tape, CD-R, or DVD-R to check for errors. If the medium is verified, the PDS operator removes it from the drive and, in the case of CD-M or DVD-R media, puts the disc into a jewel case. The PDS operator then sends the medium, along with a product summary generated by the PDS, to the dissemination department for shipment to the user.

After PDS has completed processing a unit, PDS changes the unit status to completed (C). PDSIS, upon detecting a C unit status, shall notify ECS of the successful completion of the unit. Since a unit corresponds to a granule: for multi-granule orders, several units may fit onto a single physical medium. PDS will split the order according to media size automatically. Upon order completion, a shipping label shall be produced and an E-mail sent to the customer stating completion of their order. The notification will occur only when the whole request has been completed.

If there is an error in processing the product, the PDS sets the unit status to error (G). The operator will reset the status to I when the error situation has been resolved and processing of the unit has been restarted. If the PDS cannot generate the medium successfully, the ECS operator will cancel the unit. If a unit is canceled for this reason or due to a request from User Services, the PDSIS sets the unit status to rejected (R), and the unit will no longer appear on the PDS console. This will be done except when the unit status is QC-Hold (F) or active (I) in which case, the operator will receive a message that the unit cannot be cancelled at the present time.

## 3.3 Roles and Responsibilities

Key to the success of the ECS PDS Program is understanding the role and responsibilities of all the players. ECS PDS program is using the proven Integrated Product Team (IPT) process to manage and delineate tasking. The ECS PDS IPT consists of the following groups:

NASA ESDIS is responsible for managing the overall ECS program requirements and funding for the ECS distribution requirements including the ECS PDS media requirements.

USGS EDC has been using the PDS system for many years and has been chosen by NASA ESDIS to manage the development, integration, test, and deployment of the ECS PDS system. USGS EDC EDAAC has the experience to make the ECS PDS system a reality in the required timeframe. The following bullets provide an overview of the roles and responsibilities of the ECS PDS IPT players:

- ESDIS and EDC DAAC Management (NASA/USGS)
  - Cross-element coordination and management
- ECS (Raytheon C3I)
  - Detailed technical coordination and progress reporting
  - Hardware procurement
  - Modified ECS components (5B.07)
  - ECS PDS Operator Training
  - Long-term system maintenance and documentation
  - On-site test support
- EDC DAAC (Raytheon / EROS Data Center)
  - ECS PDS development and program management
  - Initial system integration and test
  - DAAC hardware test and installation
  - System training at the DAACs
  - Short-term system maintenance and documentation
- IV&V (Navistar)
  - 5B on-site test support
- DAACs
  - ECS Test Executable installation
  - Power and facilities support
  - PDS installation and test support

The table below provides a list of the IPT members and their areas of expertise. It is an ECS PDS team policy that the program leads be informed of the need to communicate with remote developers.

***Table 3-1. ECS PDS Points of Contact***

| | | | |
|---|---|---|---|
| **Project Managers:**<br>**EDAAC Raytheon** | | | |
| Project Lead | Doug Jaton | 605-594-2633 | djaton@usgs.gov |
| System Engineer/Program Planning | Gregory Stensaas | 605-594-2569 | stensaas@usgs.gov |
| **Element Leads:**<br>**ECS Landover:** | | | |
| ECS Program Technical Lead | Steve Fox | 301-925-0346 | sfox@eos.hitc.com |
| ECS PDS Project Manager | Gary Sloan | 301-925-0797 | gsloan@eos.hitc.com |
| ECS Development | Art Cohen | 301-883-4028 | acohen@eos.hitc.com |
| ECS System Engineering/ECS Interfaces | Richard Meyer | 301-925-0430 | rmeyer@eos.hitc.com |
| | Joan Schessler | 301-925-0426 | jschessl@eos.east.hitc.com |
| ECS Test | John Brewster | 301-925-0974 | jbrewster@eos.hitc.com |
| ECS Hardware | Jim Mather | 301-925-0435 | jmather@eos.hitc.com |
| | Sarah Lewallen | 301-925-0226 | slewalle@eos.hitc.com |
| ECS Landover Project Points of Contact | Gary Gavigan | 301-883-4113 | ggavigan@eos.hitc.com |
| | Rosella Lawn | 301-925-1049 | rlawn@eos.hitc.com |
| **EDC Raytheon:** | | | |
| PDS Input Server | Erik Anderson | 605-594-2637 | eanders@usgs.gov |
| Programmer | Cynthia Fuhs | 605-594-6818 | fuhs@usgs.gov |
| DBA | Illene Olmstead | 605-594-6823 | olmst@usgs.gov |
| **EDC Raytheon:** | | | |
| PDS GOTS | Doug Hollaren | 605-594-6850 | hollaren@usgs.gov |
| PDS Programmer | Terry Vaughn | 605-594-2509 | tvaughn@usgs.gov |
| | Pat Park | 605-594-6839 | ppark@usgs.gov |
| Oracle Forms | Shane Stene | 605-594-6876 | stene@usgs.gov |
| DBA | Illene Olmstead | 605-594-6823 | olmst@usgs.gov |
| System Engineer | Kevin Lowell | 605-594-6855 | lowell@usgs.gov |
| **ECS DAAC Liaisons:** | | | |
| EDAAC | John Daucsavage | 605-594-6816 | jdaucs@usgs.gov |
| GDAAC | Mark Fuerst | 301-614-5530 | Mark.Fuerst@gsfc.nasa.gov |
| LDAAC | Gerald LeMay | 757-864-4758 | g.w.lemay@larc.nasa.gov |
| NDAAC | Renea Ericson | 303-492-1030 | ericson@kyros.colorado.edu |

The following DAAC ECS teams will be required for training and support of ECS PDS at each DAAC prior to, and during the receipt of ECS PDS.

**EDAAC ECS PDS Support Team:**
Program Support and Hardware Coordinator: Wayne Hanson
Program System Test Coordination: Barry Eberhard
System Administration: Mark Beverage
Database Administration: Darrin Foell
Software Engineering: Tom Wood
Development Test Support: Tom Wood
Hardware Administration: Chad Phillips
Operations PDS Lead: Cory Van Batavia

**GSFC ECS PDS Support Team:**
System Administration: TBD
Database Administration: TBD
Software Engineering: TBD
Test Support: TBD
Hardware Administration: TBD
Operations PDS Lead: TBD

**LaRC ECS PDS Support Team:**
System Administration: TBD
Database Administration: TBD
Software Engineering: TBD
Test Support: TBD
Hardware Administration: TBD
Operations PDS Lead: TBD

**NSIDC ECS PDS Support Team:**
System Administration: TBD
Database Administration: TBD
Software Engineering: TBD
Test Support: TBD
Hardware Administration: TBD
Operations PDS Lead: TBD

## 3.4 Hardware and Hardware Integration Requirements

This section provides an overview of the hardware requirements, program hardware being purchased by ESDIS through the ECS contract, and the integration of such hardware.

### 3.4.1 PDS Hardware

The hardware requirements were derived from ECS distribution requirements via an integrated product team set-up to establish the PDS hardware baseline. A team consisting of ESDIS, EDAAC, ECS program management, ECS M&O, ECS development, ECS SE, EDAAC ECS, EDAAC CSB. GSFC, LaRC, and NSIDC DAACs were consulted during the hardware requirements phase. The distribution throughput requirements for ECS PDS are shown in Table 3-2 below. These requirements were used to derive the hardware required to meet each

DAACs distribution requirement. The ECS DAAC distribution requirements drove the hardware requirements as shown in Tables 3-2 through 3-6.

The purchase and delivery of the ECS PDS hardware is the obligation of ECS. ECS will purchase the hardware and update appropriate ECS Baseline documentation including power, space and hardware footprint, network integration, COTS, … Figure 3.4 provides ECS PDS System Architecture and Work Space breakout. The ECS PDS hardware for each DAAC is as shown in Figures 3-5 through 3-8, respectively. The hardware for the DAACs will be delivered to EDAAC for burn in and initial installation of the PDS code and associated COTS, and then forwarded to the appropriate DAAC for installation. The PDS software will reside and execute on a different machine from the current ECS baseline at the DAACs, and the current baseline will be updated through a CCR from ECS. The SGI operating system will be IRIX 6.5. The DAACs will be responsible for providing a support team to help with the hardware set-up, integration, installation, and test. The DAAC ECS PDS support teams will be required to attend initial system training in order to prepare to ECS PDS at their respective DAAC.

The ECS PDS hardware for the EDF and the VATC is as shown in Figures 3-9 and 3-10. The hardware for the EDF and VATC will be delivered direct to the Landover facility after the completion of the DAAC integrations. The hardware set up will be the responsibility of the ECS program personnel in Landover with EDAAC technical support as necessary.

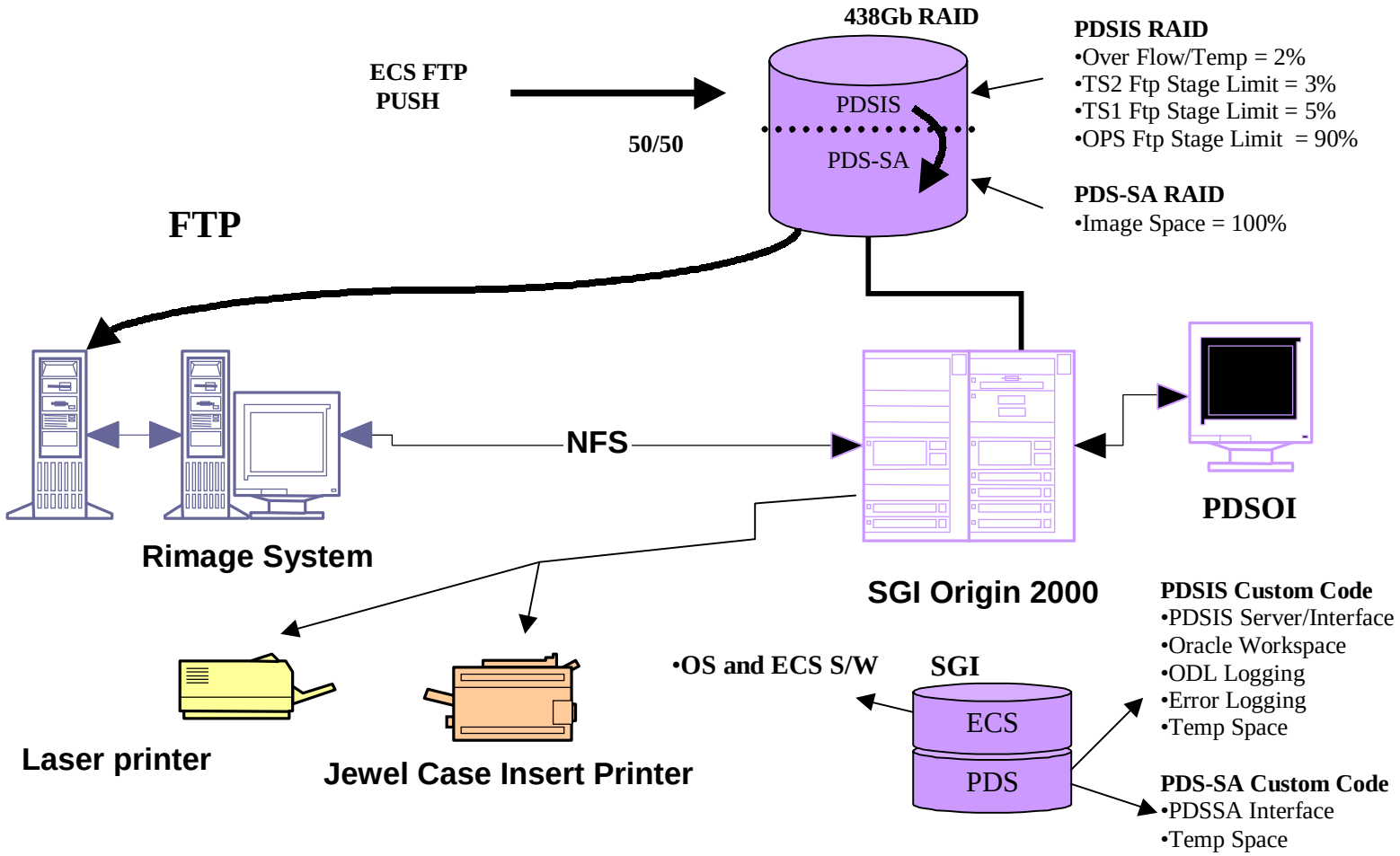



*Figure 3-4. ECS PDS System Architecture and Work Space*

### *Table 3-2. ECS PDS Distribution Throughput Requirements*

| **Assumptions:** | | | | |
|---|---|---|---|---|
| | | | GB/hr | |
| DLT throughput | | | 10 | |
| CD-R throughput | | | 4 | |
| DVD-R throughput | | | 4 | |
| 8 mm throughput | | | 1 | |
| **Required volume must be delivered in 16 hrs (6 hrs at NSIDC)** | | | | |

### *Table 3-3. EDAAC ECS PDS Distribution Requirements*

| **EDC (Requirement is 263 GB/day)** | | | | |
|---|---|---|---|---|
| **Qty** | **Device** | **GB/hour** | **Hours/day** | **GB/day** |
| 1 | DVD-R | 4 | 16 | 64 |
| 3 | CD-R | 4 | 16 | 192 |
| 2 | 8mm | 1 | 16 | 32 |
| 2 | DLT | 10 | 16 | 320 |
| | | | **Total** | **608** |

### *Table 3-4. GSFC ECS PDS Distribution Requirements*

| **GSFC (Requirement is 535 GB/day)** | | | | |
|---|---|---|---|---|
| Changed to 2 CD/2 DVD on 11/22/00 | | | | |
| **Qty** | **Device** | **GB/hour** | **Hours/day** | **GB/day** |
| 2 | DVD-R | 4 | 16 | 128 |
| 2 | CD-R | 4 | 16 | 128 |
| 4 | 8mm | 1 | 16 | 64 |
| 4 | DLT | 10 | 16 | 640 |
| | | | **Total** | **960** |

### *Table 3-5. LaRC ECS PDS Distribution Requirements*

| LaRC (Requirement is 137 GB/day) | | | | |
|---|---|---|---|---|
| **Qty** | **Device** | **GB/hour** | **Hours/day** | **GB/day** |
| 1 | DVD-R | 4 | 16 | 64 |
| 3 | CD-R | 4 | 16 | 192 |
| 2 | 8mm | 1 | 16 | 32 |
| 2 | DLT | 10 | 16 | 320 |
| | | | **Total** | **608** |

***Table 3-6. NSIDC ECS PDS Distribution Requirements***

| NSIDC (Requirement is 24 GB/day) | | | | |
|---|---|---|---|---|
| **Qty** | **Device** | **GB/hour** | **Hours/day** | **GB/day** |
| 1 | DVD-R | 4 | 6 | 24 |
| 3 | CD-R | 4 | 6 | 72 |
| 2 | 8mm | 1 | 6 | 12 |
| | | | **Total** | **108** |

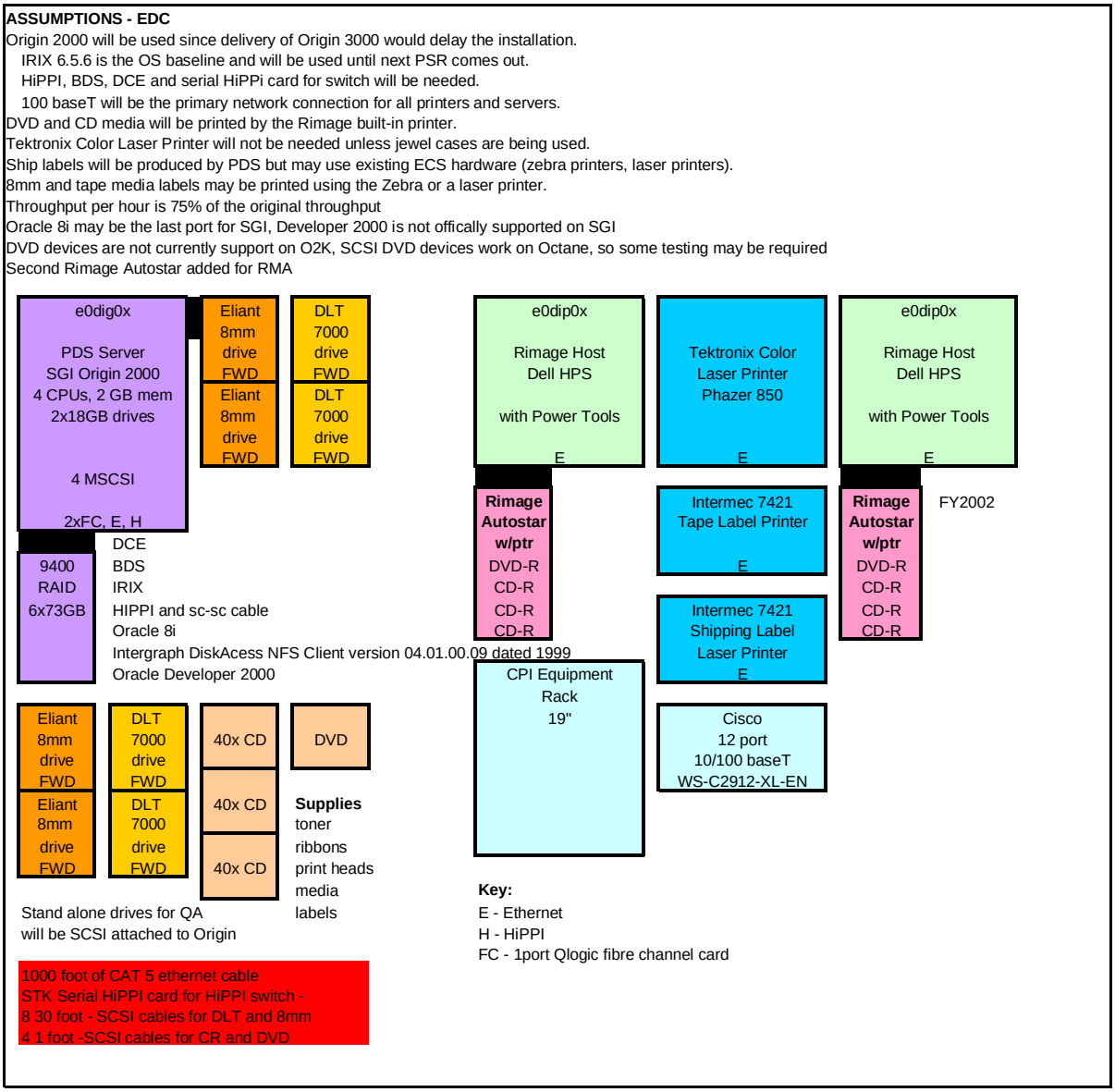



***Figure 3-5. EDAAC ECS PDS Hardware***

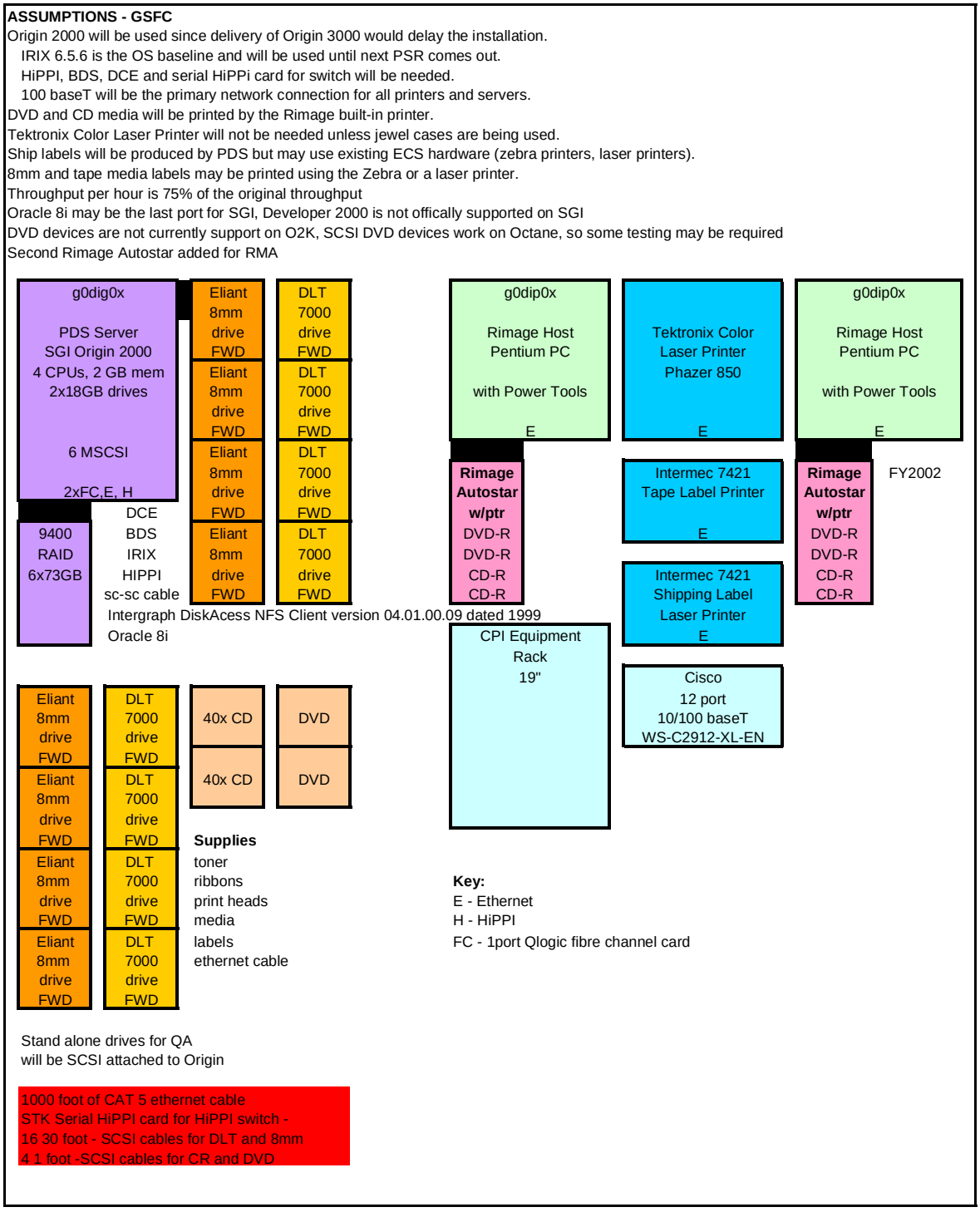
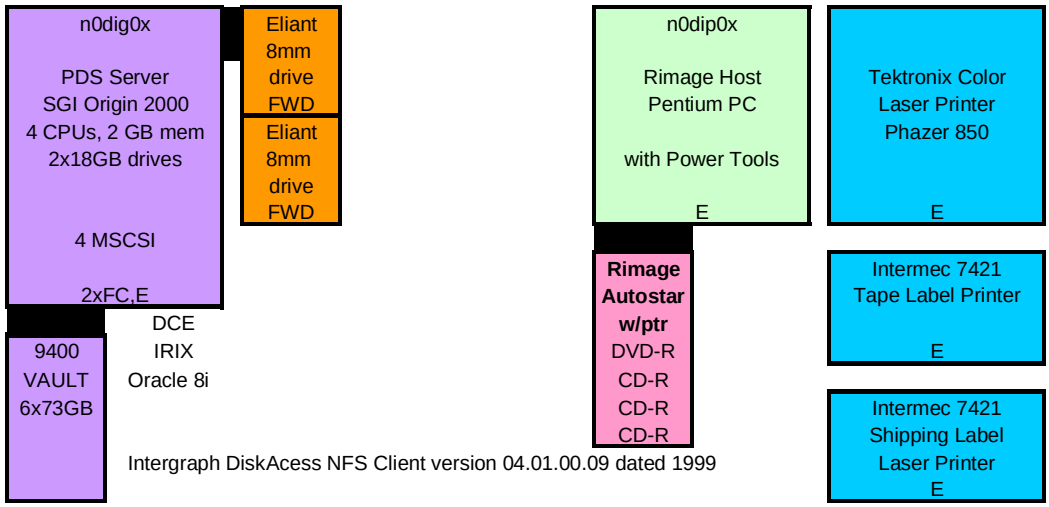


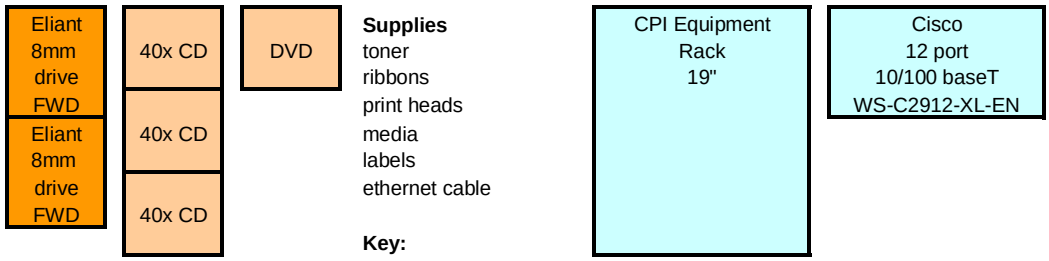

***Figure 3-6. GSFC ECS PDS Hardware***

**ASSUMPTIONS - NSIDC**

Origin 2000 will be used since delivery of Origin 3000 would delay the installation.
- IRIX 6.5.6 is the OS baseline and will be used until next PSR comes out.
- DCE will be needed
- 100 baseT will be the primary network connection for all printers and servers

DVD and CD media will be printed by the Rimage built-in printer
Tektronix Color Laser Printer will not be needed unless jewel cases are being used.
Ship labels will be produced by PDS but may use existing ECS hardware (zebra printers, laser printers)
8mm and tape media labels may be printed using the Zebra or a laser printer
Throughput per hour is 75% of the original throughput
Oracle 8i may be the last port for SGI, Developer 2000 is not offically supported on SGI
DVD devices are not currently support on O2K, SCSI DVD devices work on Octane, so some testing may be required




**Key:**
E - Ethernet
H - HiPPI
FC - 1port Qlogic fibre channel card

Stand alone drives for QA will be SCSI attached to Origin

1000 foot of CAT 5 ethernet cable
4 30 foot - SCSI cables for DLT and 8mm
4 1 foot -SCSI cables for CR and DVD

***Figure 3-7. NSIDC ECS PDS Hardware***

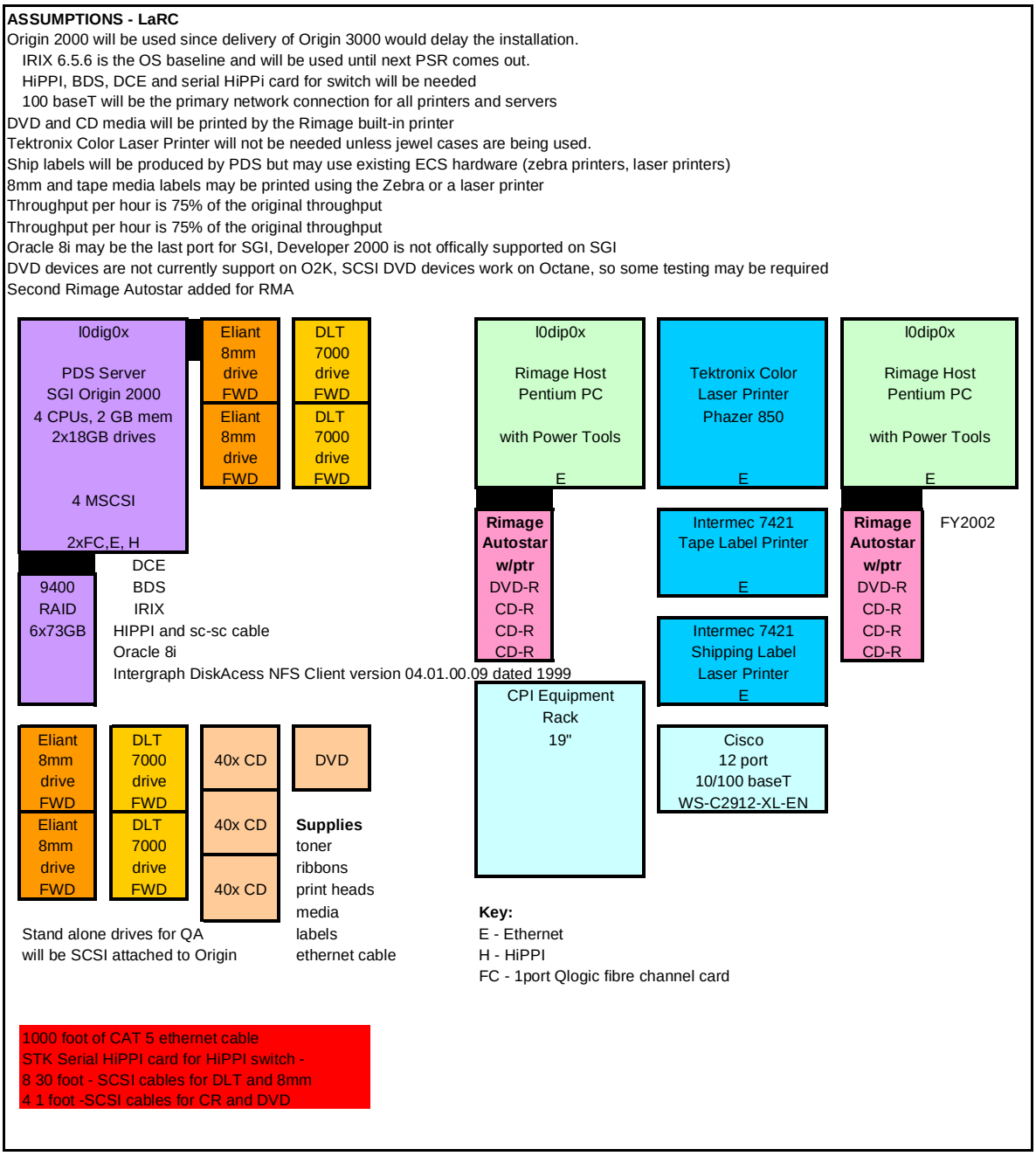
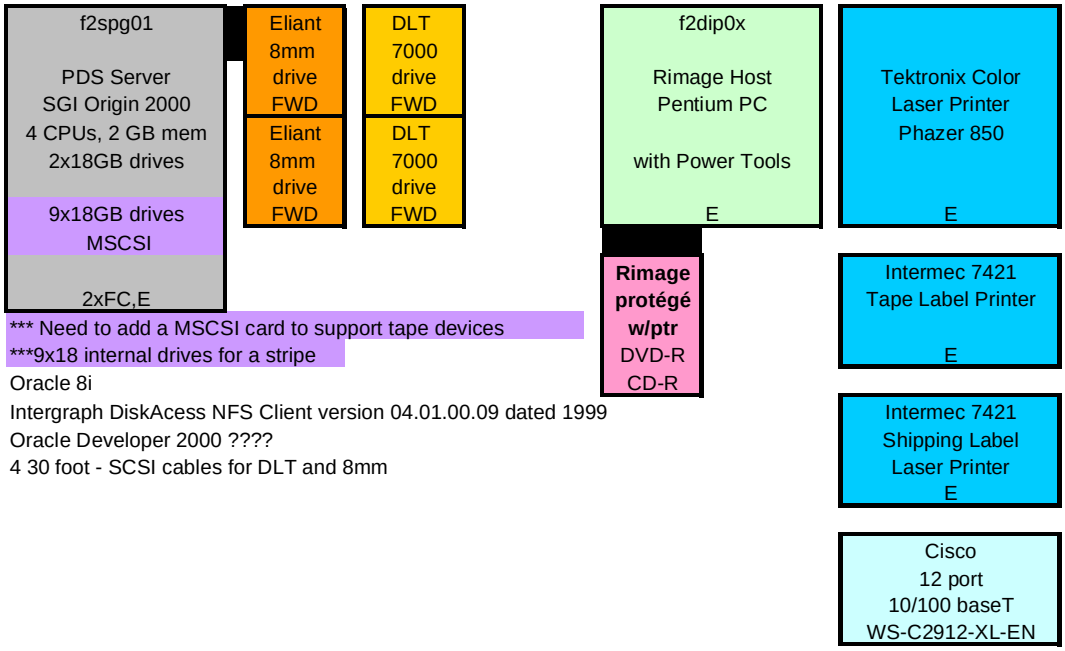



***Figure 3-8. LaRC ECS PDS Hardware***

**ASSUMPTIONS - EDF**

Origin 2000 will be used since delivery of Origin 3000 would delay the installation.
IRIX 6.5.6 is the OS baseline and will be used until next PSR comes out.
DCE will be needed
100 baseT will be the primary network connection for all printers and servers
DVD and CD media will be printed by the Rimage built-in printer
Tektronix Color Laser Printer will not be needed unless jewel cases are being used.
Ship labels will be produced by PDS but may use existing ECS hardware (zebra printers, laser printers)
8mm and tape media labels may be printed using the Zebra or a laser printer
QA devices may be shared with the PVC and VATC
A small Rimage unit is sufficient for development
Printers in the EDF will be sufficient for producing sample shipping labels.
Throughput per hour is 75% of the original throughput
Oracle 8i may be the last port for SGI, Developer 2000 is not offically supported on SGI
DVD devices are not currently support on O2K, SCSI DVD devices work on Octane, so some testing may be required




*** Need to add a MSCSI card to support tape devices
***9x18 internal drives for a stripe
Oracle 8i
Intergraph DiskAcess NFS Client version 04.01.00.09 dated 1999
Oracle Developer 2000 ????
4 30 foot - SCSI cables for DLT and 8mm

***Figure 3-9. Original EDF ECS PDS Hardware***

**ASSUMPTIONS- VATC/PVC**

Origin 2000 will be used since delivery of Origin 3000 would delay the installation.

IRIX 6.5.6 is the baseline OS

HiPPI, BDS, DCE and **2** serial HiPPi cards, one for PVC switch and one for the VATC switch will be needed

100 baseT will be the primary network connection for all printers and servers

DVD and CD media will be printed by the Rimage unit

Tektronix Color Laser Printer is only needed if jewel box is being used.

Ship labels will be produced by PDS but may use existing ECS hardware (zebra printers, laser printers, and PC)

8mm tape labels may be printed on the Zebra printers

Throughput per hour is 75% of the original throughput

Oracle 8i may be the last port for SGI, Developer 2000 is not offically supported on SGI

DVD devices are not currently support on O2K, SCSI DVD devices work on Octane, so some testing may be required

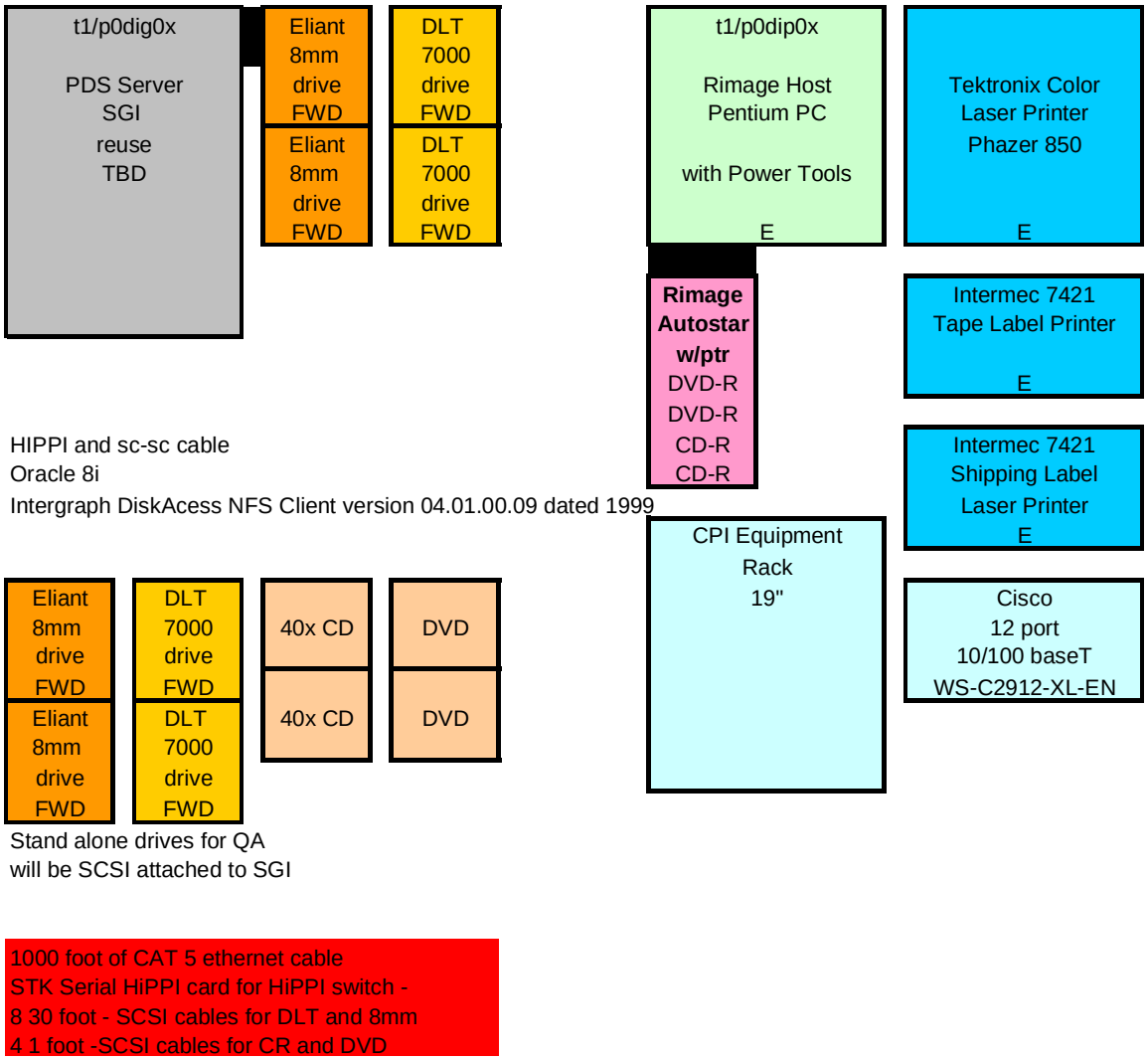



***Figure 3-10. Original VATC/PVC ECS PDS Hardware***

### 3.4.2 PDS Hardware Integration Requirements

The key to the success of the ECS PDS is the ability to establish schedules, which facilitate completion of pre-hardware facilities requirements, timely deliveries of hardware, and PDS development and integration completion, ECS PDS deployment, and ECS PDS system integration and test at the DAACs. The hardware deliveries are scheduled to be complete before the required schedule dates, and the ECS Landover hardware personnel have been working with the ECS DAAC facilities personnel to make sure that DAAC facilities requirements provided and completed in a timely manner.

PDS-SA and PDSIS will be integrated and tested by EDAAC and EDAAC CSB from a remote development system (not within ECS production network), and the PDSIS and ECS will be integrated and tested by EDAAC, EDAAC CSB, and EDAAC ECS. After these components have been tested individually and in the EDAAC ECS Test ode (TS) 2, an integrated version will be installed and tested in the EDAAC ECS TS1 mode. After install and checkout in TS1 mode, acceptance testing in the TS1 mode will commence, and upon successful completion and DAAC approval, the EDAAC ECS PDS will be scheduled for installation into the Operations mode.

The ECS PDS deployment philosophy for the other DAACs (GSFC, LaRC, NSIDC) is to provide an integrated PDS-SA/PDSIS ready to interface with the ECS test mode at the other DAACs. PDSIS/PDS-SA upgrades (development CCRs) between system build up at EDAAC and the next DAAC delivery time window will be done at the time of integration by the support team. The DAACs are responsible for installation of the ECS PDS TEs prior to the scheduled integration window and the arrival of the PDS support team. The detailed schedule in Appendix B provides the installation-required dates. The ECS Liaisons at each DAAC will provide this information to the DAAC manager for proposal to DAAC scheduling.

## 3.5 Operations Concept

### 3.5.1 Overview Operations Concept

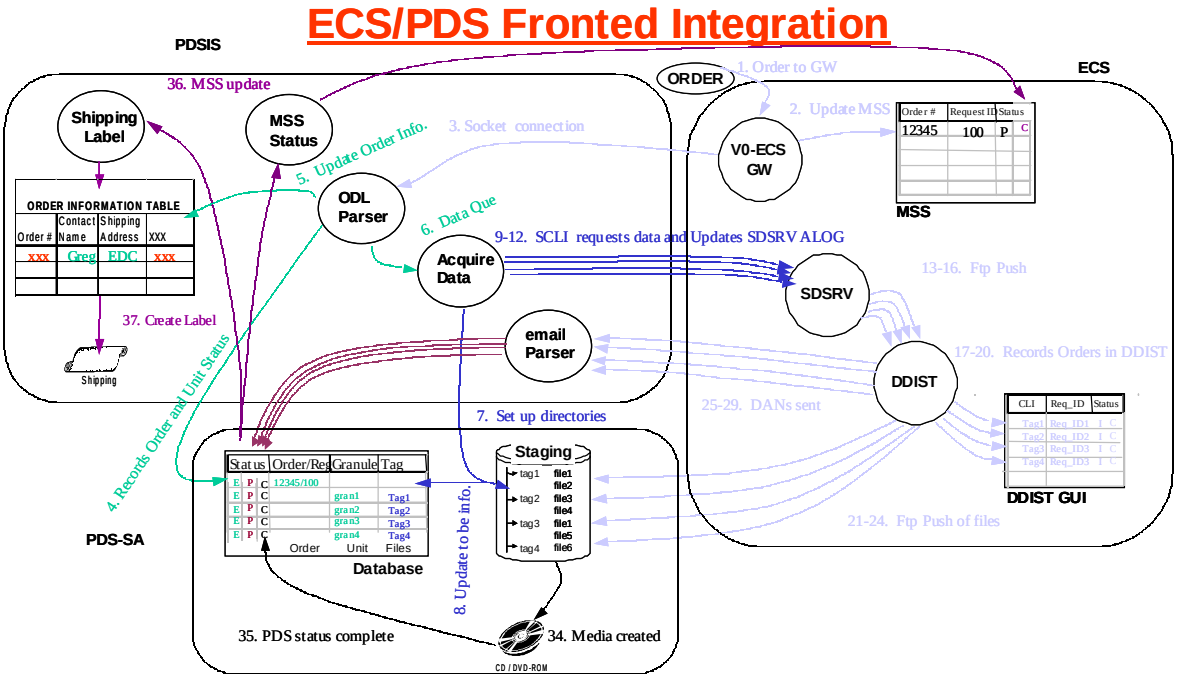



***Figure 3-11. ECS PDS Front end Integration Option***

Figure 3-11 above provides a data flow of media orders through the ECS PDS for the Drop 5B time frame. This section provides an overall, overview Operation Concept, as well as an Operations concept breakout for both Landsat-7 and Non-Landsat –7 Orders. Appendix D includes the current draft of the L-7 L1 PDS operations procedures for reference in developing a standard operational procedure. The 5BX operations concept has the ECS V0 Gateway recognize orders for physical media. It will route such requests to the ECS PDS rather than submit them to the SDSRV. Some time later and in anticipation of starting the physical media distribution for such a request, the PDS will order the data from ECS. The PDS will break up large orders into smaller sets, and in fact, may elect to order the granules in a request individually. The data will be staged by ECS via FTP to the PDS host, from where PDS will copy it onto the physical media. PDS is responsible for sending Distribution Notices to the users and creating other physical media related files such as the packing list.

Operator use includes the following:

The PDS operator checks on the status of a physical media request and controls the physical media distribution.

The ECS operator checks on the status of a PDS data order.

User Services can use the ECS order tracking GUI to check on the current status of a user request or order: the PDS will transfer certain order status changes (e.g., completion, failure) from its database to the ECS order tracking database to keep it up to date.

The following is a more detailed description of this concept.

For the ECS-PDS integration, the V0 GTWAY will be modified to forward physical media requests (i.e., requests other than FTP Push and FTP Pull) to the PDS in cases when it would submit them to the SDSRV now. It will do so after creating the ECS MSS order tracking information. The ECS V0 GTWAY does something similar today already: all Landsat requests coming from EDG are routed via DORRAN, and the V0 GTWAY will continue to do so.

The interface with the PDS will be socket based and use the same ODL message formats as the DORRAN interface. The forwarded requests will include the original order ID and request ID, UR (geOID) of the granules to be ordered, the shipping and contact information, and the physical media options (it would not include granule/order size). Note that the status of the ECS order and request are NULL at this point.

The PDS will parse the ODL and insert the request into the PDS request database. When ready to process the order, PDS will stage the data for distribution via an FTP Push data order that it will submit into ECS via the Science Data Server (SDSRV) Command Line Interface (SCLI). The PDS will request that the data be pushed to a disk staging area attached to the PDS host. At the large sites, the PDS host will be connected to the ECS HiPPI switch and ECS will perform the FTP across the HiPPI connection. The PDS will include a mechanism to pace the data orders it submits to ECS to prevent its staging disk from overfilling while keeping its physical media devices busy. The PDSIS obtains the size of each granule from ECS via a query to the SDSRV database, and will not acquire a granule unless there is sufficient disk space on the PDS host, and operators can suspend and resume the ordering of granules by the PDSIS manually.

Upon submitting the data order to ECS, the PDS will provide as input:

- The FTP Push parameters, such as host, account, password, and directory ID and a user profile reserved for PDS use so that ECS operators then can readily identify PDS orders on the ECS distribution screens and the e-mail address to which ECS will send the Distribution Notification (DN) for the data request.
- A USERSTRING parameter containing the original user Request ID and that will appear in any DN or Failed DN that ECS creates for the PDS data order; it can be used by operations to correlate a DN with the original request, should that prove necessary.
- The CLI tag parameter to support re-submission of requests in case of problems connecting with the SDSRV and which will include the original user request ID.
- The list of identifiers of the granules to be staged as provided to the PDS by the ECS GTWAY, starting with ESDT type (e.g., "SC:L70RWRS.001:2000022933").

- A request priority that the PDS will normally set to LOW, but which the PDS may elect to use to assign a higher priority to some of its data orders on occasion.
- Optionally, Landsat floating scene subsetting parameters if the data order is for a floating scene subset; the PDS will never specify more than one granule in a data order for a Landsat floating scene subset.

From an ECS perspective, the data order submitted by the PDS via the SCLI will be separate from and unconnected with the original user order that was forwarded to the PDS by the GTWAY. The SCLI will submit the PDS data order via an ACQUIRE request to the SDSRV without creating MSS order tracking information. This ACQUIRE request will be handled by ECS independently of the original user order.

However, DDIST will be modified to display the USERSTRING on its operator screens. This will permit operators to determine for PDS requests that are currently being processed by ECS, the ID of the original user request.

SDSRV will not display such information on its operator GUI. However, an ECS rpcID will be derived from the SCLI tag parameter. The SDSRV ALOG today includes information that permits an operator to associate log entries with a specific request and identify the rpcID of that request. In cases where a PDS request encounters a problem in the SDSRV, operators can use the ALOG entries to trace the ACQUIRE request back to the original user request ID.

DDIST today has a mechanism to recognize PDPS requests. It will use this to force FTP Pushes to the PDS host to occur via the HiPPI at sites where such a connection exists. This re-uses logic DDIST applies today to force the FTP to PDPS to occur via the HiPPI.

After the data requested by PDS have been pushed to the PDS host, DDIST will generate a database and send it to the e-mail address specified in the PDS data order. A PDS component will scan this e-mail address for new messages and let PDS know that the data is staged (or that the staging failed).

DDIST currently has special logic to recognize a request for Landsat data and will send a DN to DORRAN, in addition to the one sent by the user. This DDIST logic will be changed to suppress this DORRAN DN for PDS requests. DDIST will continue to send a DN to DORRAN for Landsat data requests that do not originate with the PDS. Note that the PDS will generate all DN for the physical media user orders.

On a regular basis (e.g., every 3-5 minute chron job), the PDS will check its order database for order completions and clean up image database. Upon completion of the unit in the PDS database, a complete message will go to PDSIS database and PDSIS will run a chron job every 5 minutes to clean up orders that have all the units status as complete from PDS. The PDS will obtain the ECS Request ID of these orders from the PDSIS order database and update the corresponding request in the ECS order tracking database to a matching status.

### 3.5.2 Operations Concept for Non-Landsat –7 Products

After creating the ECS MSS order tracking information, the V0 Gateway forwards non-Landsat-7 physical media requests to the PDSIS. The forwarded requests include the original order ID and request ID, UR (geoID portion only) of the granules to be ordered, the shipping and contact information, and the media options. Granule and order size are not included. Note that the status of the ECS order and request are NULL at this point.

The PDSIS parses the ODL Product Request Message and inserts the request into the PDS database. It returns a Product Result message to the V0 Gateway. The specifications for these messages are in the ICD Between ECS and EDC, 423-41-58.

When ready to process the order, the PDSIS uses the SCLI Acquire script to order the data from ECS. The PDSIS obtains granule size information from the ECS Science Data Server database to predict volumes of data to be received from the ECS. It paces SCLI requests to prevent its staging area from overflowing while at the same time trying to keep its own distribution system busy.

The SCLI order includes the following information:

- FTP Push parameters, such as host, account, password, and directory.
- A user profile reserved for PDSIS use. ECS operators then can readily identify PDSIS orders.
- An e-mail notification address that is reserved for ECS distribution notices to the PDSIS. ECS Distribution (DDIST) uses that e-mail address for all DN's (Distribution Notices) or Failed DN's it generates for PDS-submitted requests.
- The original RequestID. The RequestID is contained in the USERSTRING in the SCLI. The USERSTRING will appear in all DN / Failed DN that ECS creates for PDSIS requests. It can be used by operations to correlate a DN with the original request, should that prove necessary.
- A unique SCLI request ID (called the tag).

The SCLI does not create or update ECS order and request tracking information in the ECS MSS database. The USERSTRING (containing the RequestID) is displayed on DDIST operator screens. For PDS requests that are currently being processed by ECS, this permits operators to determine the RequestID of the original user order. ECS stages the requested data and metadata files via FTP Push to the designated PDSIS staging area. DDIST recognizes PDSIS requests and routes them through an FTP Push server that is connected to a HiPPI interface if such a connection exists at the DAAC.

After the data requested by the PDSIS have been pushed to the PDSIS host, DDIST generates a DN and sends it to the e-mail address specified in the PDSIS SCLI request. The PDSIS scans this e-mail address for new messages to determine when data is staged or that a distribution has failed.

The PDS generates a packing list and the media and sends an e-mail distribution notice (order shipment notification) in standard ECS format to the user's designated e-mail address as

specified in the original ODL order. The media is mailed with the packing list to the user's designated address.

**On a regular** basis (every 5 minutes, for example) **HOW** the PDSIS checks the PDS database for order completions and **certain status changes define these** that are not yet reflected in the ECS MSS database. The PDSIS obtains the ECS Request ID of these orders from the PDS database and updates the corresponding request in the ECS order- tracking database to a matching status. User Services can use the ECS order tracking GUI to check status of physical media orders.

### 3.5.3 Operations Concept for Landsat –7 Products

The V0 Gateway separates user requests for Landsat products from other requests and routes them to DORRAN at EDC. DORRAN sends a verified request back to the V0 Gateway. The gateway recognizes that this request is now coming from DORRAN because it contains a valid order ID and request ID. This interface is documented in the ICD Between ECS and EDC, 423-41-58.

In accordance with the scenario for non-Landsat-7 products, if the verified request is not a physical media order, the Gateway submits it to the Science Data Server. Otherwise, the V0 Gateway routes an ODL Product Request to the PDS, which responds to the Gateway with a Product Result.

The PDSIS eventually submits a SCLI Acquire for the requested Landsat data. If the request is for a floating scene, the SCLI includes the subsetting parameters. The PDSIS will not submit a floating scene subsetting request for more than one granule in a single SCLI Acquire. The Science Data Server performs the subsetting and passes the resulting files to DDIST for FTP Push distribution to the PDSIS.

The DDIST special logic to recognize Landsat requests and send a Distribution Notice (order shipment notification) to DORRAN when Landsat orders have been filled is suppressed for PDS requests. The PDS notifies DORRAN of the completion.

### 3.5.4 ECS PDS Operations Dataflow

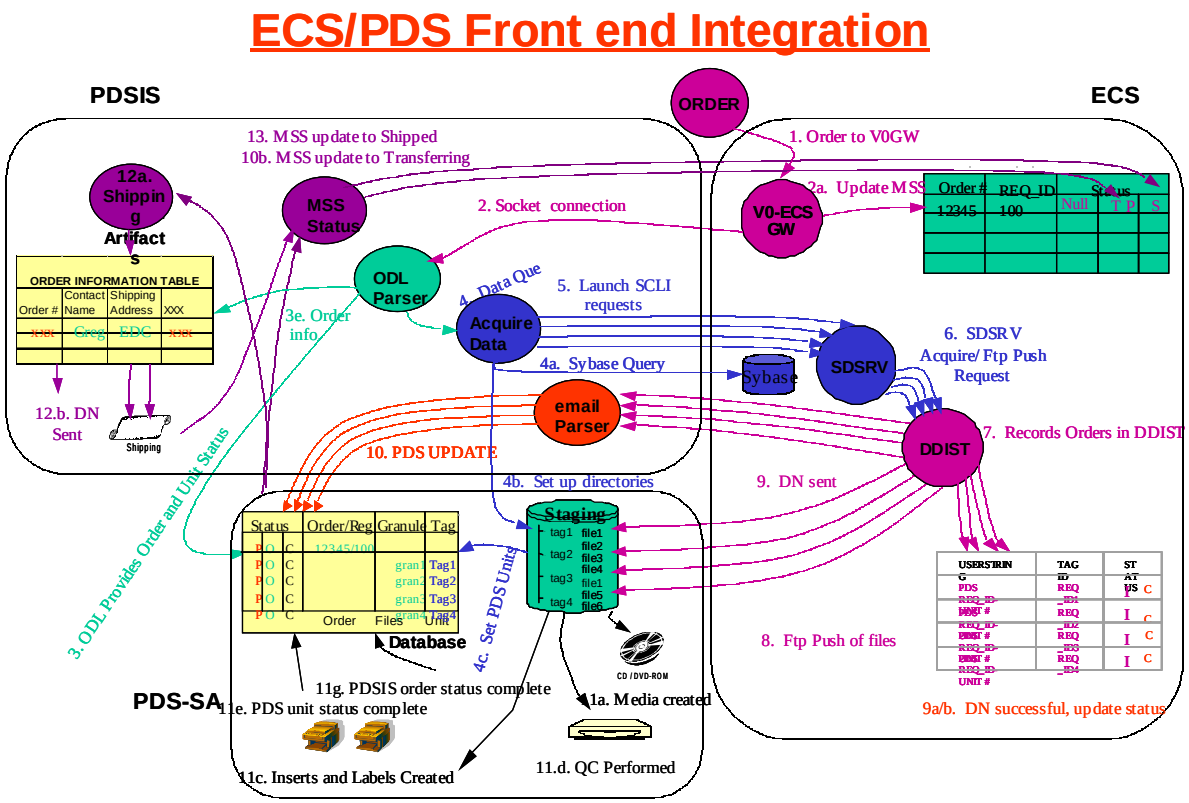



***Figure 3-12. ECS PDS Dataflow***

The following provides a step by step data flow for the ECS PDS. The red lines denoted with an ”E” in the numbering scheme are error recovery discussion points for ECS PDS operation.

1. Order from EDG through the V0GW via Socket Connection
   a. Order ODL created that contains ECS Order #, ECS REQ_ID, Granule #, Dataset ID, Media Type, Media Format, User Info/Addresses, …
   b. Order Information is updated in the ECS MSS database (ECS Order #, ECS REQ-ID)
2. PDSIS Socket Connection From V0GW
   a. If successful acknowledgement - MSS Status at Null (0)

2E1. If Fail - EDG client receives fail message

3. Parsed ODL Creates Order Unit Level Status in Database
   a. PDS Order # assigned (equal to Req_ID)
   b. Order Status is at “0” Received

c. Unit status is at “0” Received

d. Order Information Filled in

e. MSS updated to Pending (P)

3E1. Database is down, PDSIS rejects handshake and EDG client receives fail message

4. Data QUE

a. Query Sybase for SizeMBECSDataGranule

4E1. Database down, PDSIS sets error flag to Yes and retries (unit status still “O”), ECS operator fixes condition, PDS OPS resets error flag to No and retries happen (unit status “O”)

b. Check for unallocated space on staging disk (working storage)

4E2. Disk allocated – orders que until space is available

c. Set up directory path and assign destination to unit # (granule #) in PDS-SA

5. Launch SCLI

a. Request FTP PUSH of granule to staging disk directory path

b. Ftp request acknowledgement (1 or 0) (0=Okay)

c. Unit Status Updated to “R” (ECS request)

5E1. Ftp request acknowledgement fails (1 or 0) (1=Fail)

5E2. Unit Status Error Flag set to Yes “Y” and is retried. PDS Operator resets Flag set to “N” when ECS is fixed.

(If the SCLI returns an SDSRV error, operator intervention will be needed; the most likely cause is a bad UR. If the SCLI returns other connection errors or does not return at al, an automatic retry is appropriate after some wait period. Suggest a max retry period of 15 minutes (but configurable by DAAC); after that, operator involvement will be needed to correct the problem. Since the PDSIS could attempt submission of a lot of requests in a very short time period, PDSIS designers should give some thought as to how to prevent overwhelming the operators with suspended requests.)

6. SDSRV receives acquire

a. Write ALOG for troubleshooting purposes

b. FTP PUSH request goes to DDIST

6E1. SDSRV request fails; reset Ftp Push order via script in ECS

6E2. Support cancels SCLI order due to bad data

7. DDIST

a. Records Order in DDIST as status (I)

7E1. DDIST down, SDSRV qued up until DDIST is up, then it is updated

b. Operator query by PDS USERSTRING (PDS)

8. DDIST FTP PUSH to staging disk directories

8E1. FTP PUSH fails, ECS Operator retries order suspended w/errors on DDIST

8E2. Or ECS Operator cancels order and send a "failed" email to PDSIS

9. DN sent to PDSIS email Parser

a. Successful DN received

b. Ftp Status update to complete "R"

9E1. Unsuccessful Failed DN

a. Unit Status Error Flag set to Yes "Y".

b. If Recoverable, ECS Retry/fix email and resend manually

c. PDS Operator Resets error flag to "N" and retries New SCLI

9E2. If Not Recoverable,

a. If ECS Operator decides fail is fatal, Order unit can be rejected.

b. PDS Operator changes Unit to Reject "X "

10. Update corresponding PDS Order Status to Received "D"

a. PDSIS Job Control accounts for all Order Integrity and release REQ_ID to PDS-SA Operator GUI by changing the Status to (P) when all units are accounted for

b. MSS is updated to Transferring (T).

11. PDS Operator assigns order units to media drive.

11E1. File Size related to Media Selection Error

a. Operator changes media type and changes "E" to "O" in the PDSIS Config GUI (System Support)

b. Or Operator changes "E" to "X" for failed unit and order proceeds w/o failed unit

c. Policy needed as to whether Customer Services helps fix order media error or if the email goes back as rejected for that unit and the customer reorders

a. PDS creates Media.

b. Operator monitors Production Process.

c. Inserts and Tape Labels are generated.

11E2. Failures can be retried.

d. PDS Operator Performs QC.

11E3. If Corrupt file/Bad Media, pick a new drive and restart.

e. PDS updates Unit Status to complete

f. PDSIS delete unit from Storage Space, PDS_SA deletes entry

g. PDSIS Job Unit Control accounts for order integrity, orders are updated to complete "C" when all units are accounted for.

12. Shipping Artifacts are created

a. A physical Packing List is printed.

b. A customer DN has been emailed that is the same as the Packing list.

c. Shipping Labels are printed.

d. Operator packages order and send to dissemination.

e. PDSIS updates order Status to Shipped (S).

12E1. Failures can be retried, or manually recreated.

13. MSS Status update of REQ-ID is set to Shipped (S)

Storage disk and databases are cleaned up

13E1. If MSS down, ECS fix condition, and PDSIS reset error flag from "Y" to "N" and retries a configurable amount of times

## 3.6 Program Schedule

Key to the success of the ECS PDS development is the ability to establish schedules, which facilitate component development free from delays caused by resource dependencies. Such delays can be caused by lack of personnel resources, computer hardware or software resources, and most critical, the dependency of one component to support the development of another.

This section provides an integrated ECS PDS program schedule, which will be used to track program process and resources. The schedule will be updated weekly and reviewed in a weekly ECS PDS IPT telecom. Critical path analysis will be used throughout the program to mitigate risk and to allow the most efficient use of resources. The schedule will be updated in conjunction with IPT weekly telecom and the Incremental Program Reviews through turnover to the DAACs.

The ECS PDS schedule establishes the underlying sequencing, dependencies, and relative time frames for the development and support activities to support the ECS PDS program. They begin as the detailed designs stabilize and provide the migration path whereby prototypes and incrementally developed components are incorporated into the formal development and test processes. These schedules provide the basis for detailed planning, which monitor the development phase of activities to ensure a smooth transition into the integration, test phase, deployment, and turnover of the program. Figure 3.13 shows the ECS PDS Overview Schedule, and Appendix B provides a copy of the ECS PDS Detailed Schedule from which the overview schedule was built.

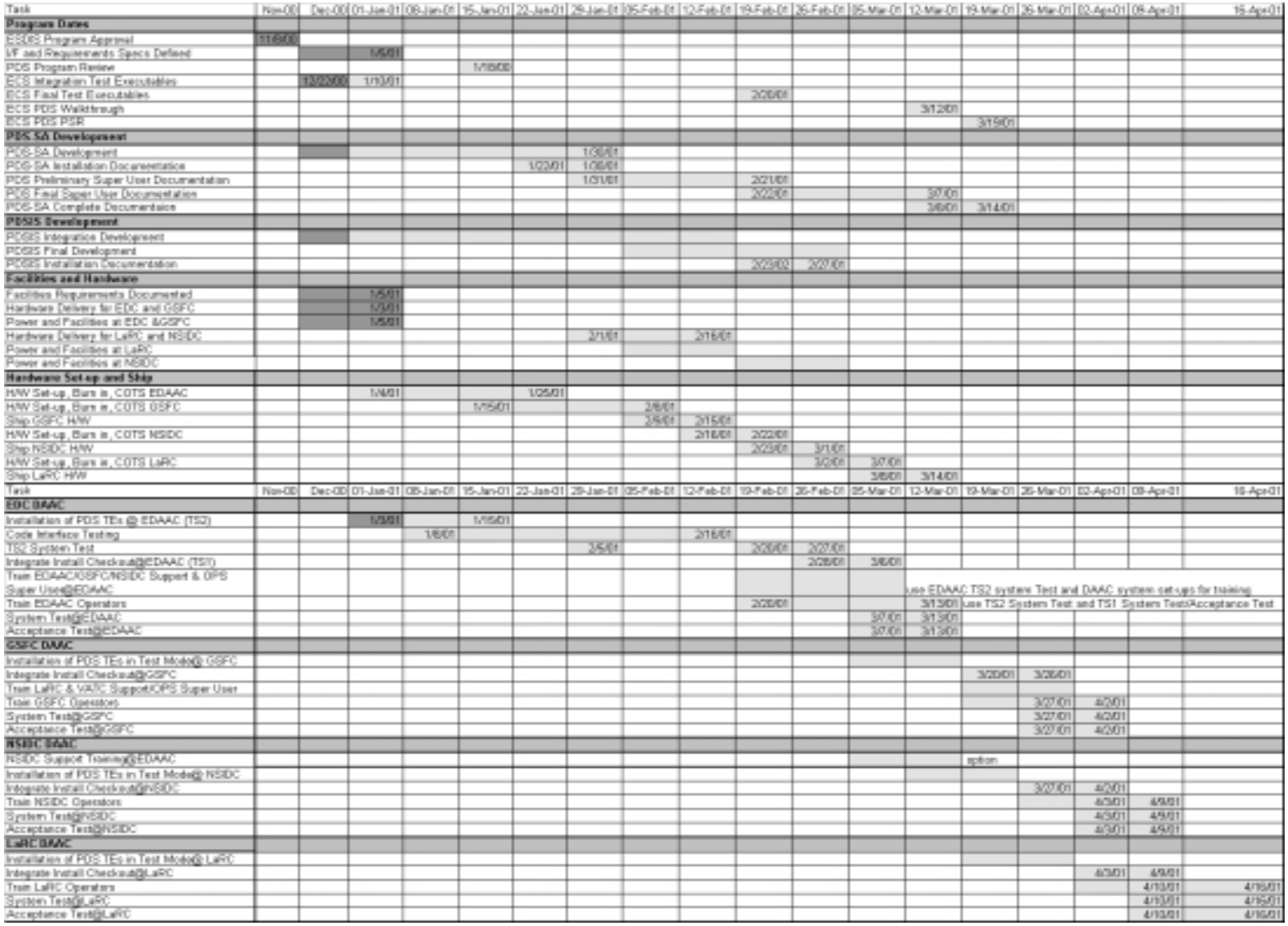



***Figure 3-13. ECS PDS Schedule***

## 3.7 Risk Mitigation Plans

### 3.7.1 Risk Management Approach

Achieving balanced technical/cost/schedule performance for a critical, quick reaction project enhances the need for risk management, the ECS project emphasizes risk identification and management. This section describes the ECS PDS program's approaches to this critical process. This process is composed of four stages. This section provides a brief and high-level description of the four stages used during the risk management approach for ECS PDS. The four stages are listed below:

**1. Risk Identification** - Risk items will be identified over the course of the ECS PDS Development Program and recorded on the Program risks list managed by the project lead. Any ECS PDS associated personnel can identify risks with potential technical, cost, or schedule impacts and report to the project lead. The project will then designate a "Responsible Individual" through the IPT to lead all activities related to that particular risk. Identified risks will be moved to the Risk Assessment stage of the Risk Management Process.

**2. Risk Assessment -** Detailed analyses of the identified risks and associated drivers are performed by the assigned Responsible Individuals. The analyses are conducted to discover the causes, effects, and magnitude of perceived risks. They consist of determining the probability of potential risk occurrence (probability of occurrence, Pf) with respect to design maturity, system complexity, and dependency variables and evaluating all technical, cost, and schedule consequences (consequence of failure, Cf) caused by the potential risk.

**3. Risk Mitigation** - In this stage, IPT evaluates various mitigation alternatives presented by the Responsible Individual for cost, impact, effectiveness, and feasibility and approves a mitigation plan for implementation. The mitigation plan identifies details of mitigation activities with schedules and the supporting organizations. It also provides detailed actions with schedules for completion. For highly significant risks, contingency plans may also be developed and documented during this stage; contingency plans address the situation where the selected mitigation might fail, and provide for documented alternate courses of actions.

**4. Risk Monitoring** - After approval of a mitigation plan for implementation, the Risk Management team (in this case, the ECS PDS IPT) will periodically review the status of the related risk action items and assess their progress via risk meetings. If there is any indication of an increase in the severity of the risk, the risk is referred back to the mitigation stage for further option analysis. In addition, risk metrics (impacts and probabilities) will be reviewed and updated periodically.

### 3.7.2 Known Risks and Mitigation Strategies

Threats with potential technical, cost and schedule impacts will be routinely identified and evaluated during the normal course of program execution. The program risk chart as shown in Appendix F will be a risk tracking tool used during every ECS PDS weekly telecon. Based on experience with the program to date, the following risks have been identified:

1. Timely and complete delivery of required hardware to EDC for burn in and configuration is critical to maintaining a reasonable schedule for installation and integration at the DAACs.

ECS by working with the Government has purchased hardware on a quick turnaround basis that will mitigate any risk associated with critical path hardware delivery requirements. ECS will continue to work with ESDIS and the hardware contractors to ensure timely deliveries of hardware to EDC. Hardware requirements to meet ECS PDS schedule commitments will be tracked and reported on a weekly basis until all ECS PDS development hardware issues are resolved.

2. Ability to obtain timely agreement on interface and requirements/specification issues included in Interface Control Documentation and Requirement Specification Documentation.

EDAAC and ECS will continues to work with the component points of contact to finalize the ECS PDS interfaces. The interface and requirements documentation will be configuration managed in a strict CM environment to insure proper software coding and integration. The interface and requirements documents are a major driver to the project schedule and will be followed to completion by the project leads.

At this point in time, all the interface and design issues related to the documentation are well within program schedule requirements and associated risk is very low.

3. The risk of distribution requiring computer resources over and beyond the ECS contract baseline impacting the effectiveness of the operational systems at the DAACs. ECS and ECS DAACs will continue to distribution during the development and IOC to determine if additional resources are needed. The ECS PDS system has the capability to handle more than the current distribution requirement, if more staging disk is required, the ECS PDS design can easily accommodate additional disks. The PDS system has been in use at EDC for many years and the distribution capacities and aspects are well understood. The associated risk is deemed to be low.

4. The concern about development resources being available to meet the integration phase of the ECS PDS components.

This is considered low risk due to the fact that there are currently preliminary versions for 2 of the current TEs with follow-on pre-integration TEs and final TEs already planned and being worked at ECS.

5. Ability to maintain required staffing skill mix for delivering ECS PDS release capabilities.

ESDIS and ECS have committed to providing ECS resources from the development facilities and the DAACs to support system integration and test. With approval and coordination of resources and appropriate planning, integration and test at the DAAC s should be a minor risk.

6. The risk that the selected architecture may not satisfy the Fail over requirement and additional material may be needed. (RMA).

ECS is performing an assessment of RMA for its systems at the DAACs and is planning to perform a more accurate assessment of RMA at Release 6B. If necessary, the H/W configuration

will be supplemented. The RMA of the PDS system at the EDC is very reliable and can support numbers consistent with the ECS requirements.

7. The risk that the DAAC facilities will not be ready with power and space to support ECS PDS integration. This item is a critical path item that has been a problem in the past. However, early development visits to each of the facilities and preliminary documentation has been provided to the DAAC s to allow necessary requirements to be analyzed and the long lead items to be put into motion. The risk is considered high because the program has no control over the DAAC facilities and without facilities ECS PDS cannot complete schedule requirements.

8. Concern about unpredictability of COTS vendors upgrading or changing their products affecting the ECS PDS system.

ECS continues its aggressive policy to obtain timely information from vendors regarding their product changes and planning/updating ECS's activities based on criticality of these changes. Additionally, ECS continues its negotiation strategy with its vendors pursing extended product support agreements if necessary. The near term issues here are minimal all software compatibility issues that are currently known are being addressed via testing with fall back to older version acceptable to meet current program needs; therefore, the risk is considered low. However, there has been some concern over the support of Oracle on the SGI in the future. This could become a potential follow–on risk that needs to be tracked.

9. Potentially, ECS and DAAC support resources will require key development expertise for maintenance and follow-up.

EDAAC will maintain a technical support staff for approximately 1 year through 4$^{th}$ QFY01to minimizes technical issues. ECS PDS will be using delivered ECS code and using standard troubleshooting processes further reducing this risk. System and Operator training will be provided prior to operational release. EDC currently uses a PDS system with very few issues, and a high stability. Therefore; this concern is valid but considered to be a very low risk.

10. Ability to transition from current media distribution to ECS PDS with minimal system downtime impacting the operational environment. The ECS PDS can be tested in the test modes to minimize downtime associated with integration into the operations modes at the DAACs. Also the current ECS distribution system can continue to work until full switch over to the ECS PDS has been accomplished.

11. EDAAC development resources required to complete development are limited.

EDAAC has developed a risk migration plan associated with this issue by having a support contract in place to allow for project growth, and program slip if needed. Current risk is medium due to learn to time associated with back up personnel in a short program time window.

1. The use of new DVD technology within the ECS PDS. EDC has done some testing of the DVD technology and has an on-going development and implementation project underway. The risk of incorporating DVD in the phase 1 ECS PDS by the first part of March is in the medium risk category. However, the risk is low that DVD would be available by the first part of April for integration and test.

2. NASA ESDIS and ECS developer have on-going action to limit appropriate media selection at the time of order via the client. This will not be available initially.

   PDS supports Super-User concept of "revising" media choice and/or cancel. ECS Distribution Operators will intercede and coordinate order recovery action via ECS procedure (out of scope). This will become a much bigger issue as we go to B&A (EDC B&A is planned for 10/01/01).

3. ECS PDS out-year sustainment and maintenance support after delivery/turnover to the DAACs is a concern.

   This is a low risk item due to the fact that ECS sustainment can happen easily with the current ECS code sustainment process, and EDAAC development support can be tied into the help desk during the interim (ECS with small on-going FY01 tech consult). ECS M&O evaluate current process to ensure support.

4. Order/Media Metrics are not within the scope of ECS PDS. Metrics are out of scope but logging is provided for troubleshooting, and MSS will be updated with "minimum" information (i.e. status). ECS and DAACs should provide requirements input to ECS Dashboard.

5. ECS PDS media for testing and operations is required. The physical media for testing will be provided by ECS contract; however, the media is not available yet. The risk is low because media can be purchased and paid for via USGS to support program start up requirements, if necessary. ECS will develop initial media buy. EDAAC will develop MOA with EDC DSB to obtain test media, if required.

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# 4. Component Development

This section provides an overview of the ECS PDS component development process and describes the PDS GOTS development and test, PDSIS development and test, and the ECS interface and test.

## 4.1 PDS GOTS Development

The PDS GOTS development consists of the following tasks.

Create a standalone PDS with a defined interface that can be delivered and installed at the various DAAC sites:

- Define Requirements and Interface Control Document (ICD)
- Separate PDS from DORRAN as standalone instance
- Generate installation procedures and documentation
- Support up to four new “generic” production modules (one for each DAAC)
- Support hardware specification and installation
- Support training for hardware and PDS installation (EDC and one other site)
- Provide ECS PDS technical consultation through the end of FY01

The PDS-SA can support many production modules, which can be developed by the DAAC to meet future product growth; however for the initial delivery there will be a generic Production module developed for each DAAC. Only HDF-EOS products will be allowed for production in the initial delivery. The initial delivery will support individual orders may span multiple physical media, multiple datasets may be stacked on the same physical media, and the jewel case inserts will follow a common format for all DAACs. An example of the CD-ROM label and jewel case insert is presented below. The Delivery Notice (DN) email will provide the same information to the customer as provided on the packing list.


***Figure 4-1. CD-ROM Label***

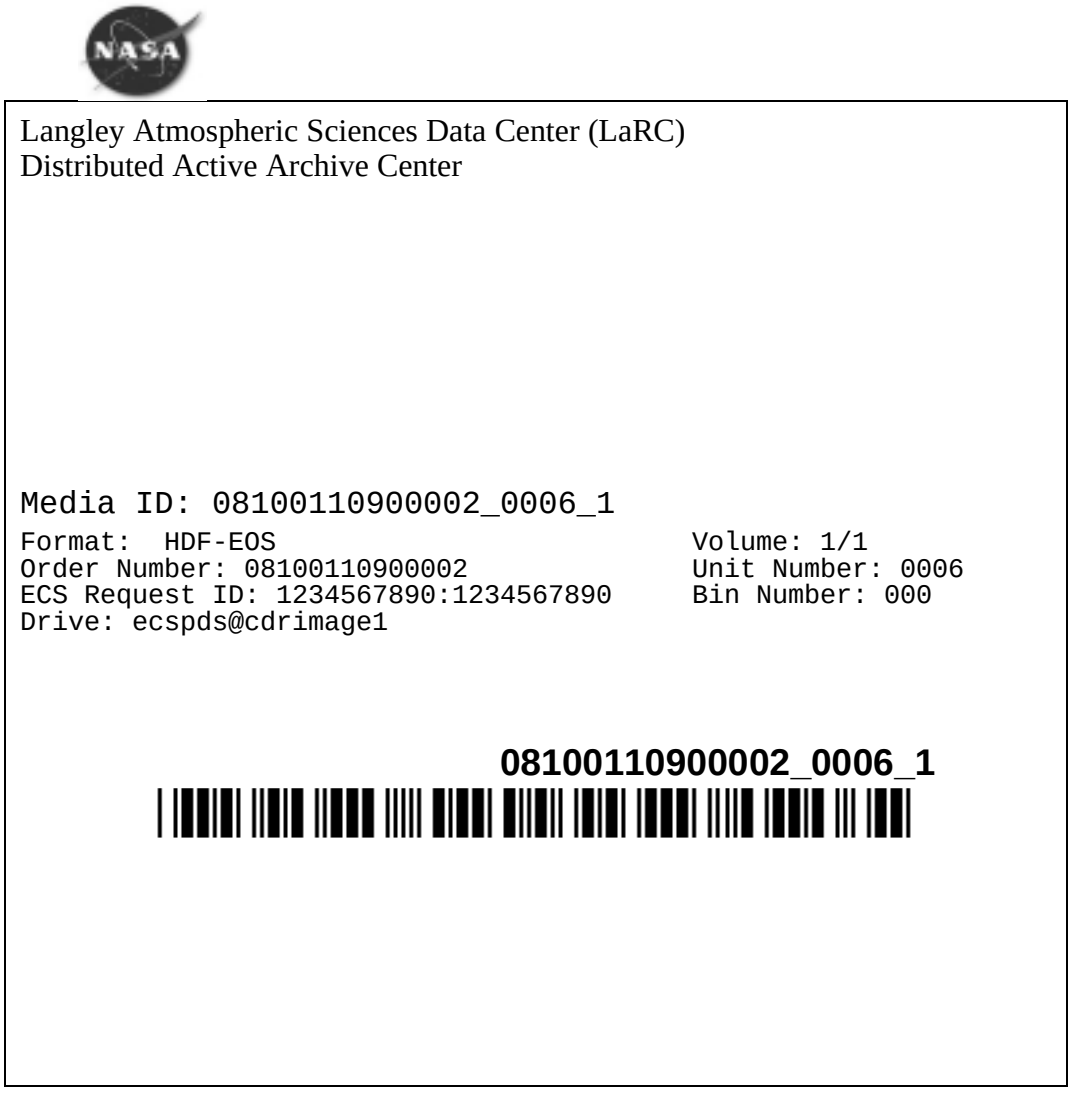


***Figure 4-2. Sample CD-R Jewel Case Insert***

## 4.2 PDS GOTS Development Testing

The PDS GOTS development test consists of developing a standalone system that can be integrated with the PDSIS in accordance with the PDSIS PDS-SA ICD listed in Section 2.

The PDS-SA will be tested with the PDSIS via a test development system at EDC. The SGS23 system is a SGI challenge and will be used to host PDS-SA development and testing. After delivery and set-up of the EDAAC ECS PDS Hardware a test transition with happen in TS2 mode to allow the development testing to happen within the ECS production environment.

The following components will be tested by PDS-SA development:

PDS System Configuration, Oracle Testing, Product Module testing, and Unit Code Testing.

## 4.3 PDSIS Development

The PDSIS Development consists of following subtasks

- Create a PDS Interface layer that receives ECS orders and feeds them to the PDS-GOTS system. Minimize ECS development while maintaining the integrity of the off-the-shelf PDS capability.
  - Define Requirements and Interface Control Document (ICD)
  - Develop and test ODL Parser that receives order ODL and stores in new tables
- Order information in new tables is significant growth to database (name, address, etc…)
  - Load product/granule information into PDS-GOTS via ICD (tables)
- Assign datasets to correct prod_code and production module via lookup table and/or default
  - Acquire granules from ECS using the SCLI interface protocol
- Throttle requests to maximize working storage space
- Delete granules as product are created.
  - Update MSS Order information with appropriate status (for ECS metrics)
  - Develop Shipping label upon order completion
  - Develop GUI for operator intervention (reprint shipping labels, update tables, etc…)
  - Develop software documentation and installation support (configurable attributes)
  - Support training PDS installation (EDC and one other site)

## 4.4 PDSIS Development Testing

The PDSIS Development Testing consists of testing for the following areas listed below. An Interface Simulator will be developed and used by PDSIS development in conjunction with preliminary ECS test executables to allow early interface testing.

- Server Component Set-up
- ODL Parser Component
- Database Set-up
- Acquire Product component
- Email Parser Component
- Staging Disk Clean Up Testing
- Shipping Label Component artifact testing
- MSS Status component
- PDSIS GUI Manager (error/recovery)
- Product Module Testing
- Code Integration and Testing
- Media Label and Insert Testing
- Shipping Artifact Testing

## 4.5 ECS Interface Development

The ECS program will provide ECS code to support the ECS to PDSIS ICD referenced in Section 2. The preliminary test executables for SDSRV and VOGW will be delivered early (prior to test, prior to end of 12/31/00) in support of verifying unit level interfaces. Pre-integration test executable versions of the SDSRV, DDIST, MSS, and DMS will delivered on 1/10/01 in support of ECS PDS integration testing. The final version of tested PDS test executables will be delivered on 2/20/01 in accordance with the ECS Deployment process.

## 4.6 ECS Interface Development Testing

The ECS PDS interfaces will be tested for the ECS PDS test executable interfaces via the ECS development facility (EDF) before release of the integration version of the test executables. Also ECS PDS development at EDAAC tests each interface during developmental testing.

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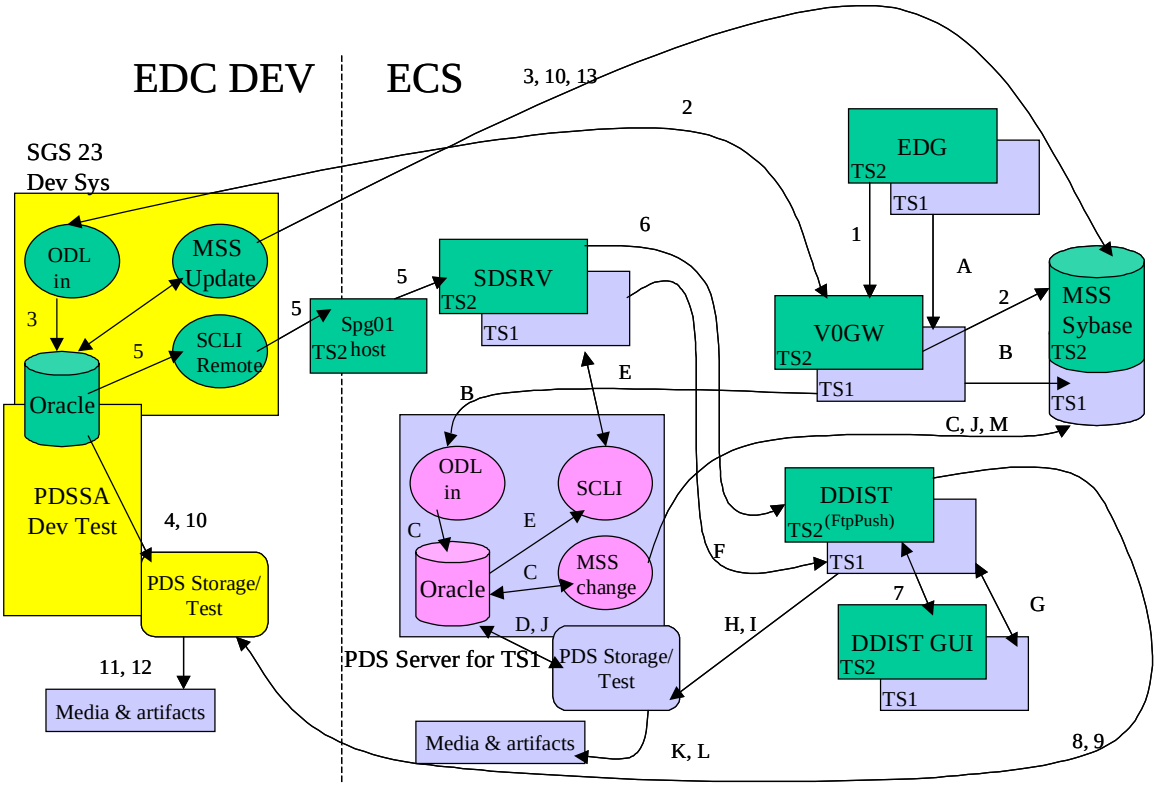
# 5. ECS PDS Integration and Test

This section describes how the ECS PDS development system will be tested prior to PSR. The ECS PDS will be tested via 1) hardware and COTS verification testing, 2) installation verification and system checkout, 3) interface verification in the VATC and at EDC, and 4) integrated development system testing and acceptance testing at EDAAC.

## 5.1 Component Integration

The ECS PDS hardware will be set-up, integrated and burned-in, and installed by the EDAAC ECS PDS development team with support from EDAAC ECS support personnel. Documentation for this process will be provided via the EDAAC ECS PDS development team. Hardware System Acceptance Testing will be completed by the development team on all systems. The following figure and table provides an idea of the Test Mode development integration at EDAAC.




| TS2 | TS1 | |
|---|---|---|
| 1 | A | 1. Order from EDG through the V0GW via Socket Connection, order ODL created, Order info updated in Database |
| 2 | B | 2. PDSIS Socket Connection From V0GW and MSS Status to Null (0) |
| 3 | C | 3. Parsed ODL Creates Order Unit Level Status in Database and MSS updated to pending |
| 4 | D | 4. Data QUE, Sybase Granule size query, staging disk allocated, directory path assigned |
| 5 | E | 5. Launch SCLI, FtpPush to staging disk directory, unit status updated to R |
| 6 | F | 6. SDSRV receives acquire, alog written and FtpPush request goes to DDIST |
| 7 | G | 7. DDIST records order and operator checks via USERSTRING (PDS) |
| 8 | H | 8. DDIST FTP PUSH to staging disk directories |
| 9 | I | 9. DN sent to PDSIS email Parser (ftp status complete) |
| 10 | J | 10. PDS Order Status updated to Received "D", job integrity checked by PDSIS and MSS updated to transferring |
| 11 | K | 11. PDS Operator assigns order units to media drive (media created, QC, update status and data cleanup) |
| 12 | L | 12. Shipping Artifacts,created, disemmination, PDSIS status updated to shipped. |
| 13 | M | 13. MSS Status update and DB/disks cleaned up |

***Figure 5-1. EDAAC Test Mode Integration for PDS Development***

## 5.2 Install and Checkout

ECS PDS Interface Pre-integration Test Executables delivered by the ECS Development Facility in Landover, MD, will be installed at EDAAC in support of PDS development. The Test executables will be installed and tested by the DAAC with simulated orders to verify that the PDS TEs are working and configured properly. When the PSR has been completed, the ECS PDS Test Executables install and testing should happen prior to the arrival of the EDAAC PDS

support team to set up the hardware, when appropriate. Other ECS machines will be used to test configuration in the test mode prior to actual installation of PDS hardware.

Integration, installation and Checkout of the ECS PDS system (ECS I/Fs and Test Executables, PDS GOTS, PDSIS) will be completed by the EDAAC ECS PDS development team with support from the EDAAC ECS system support group. Integration, installation, and checkout documentation will be developed, review, and redlined via the EDAAC test mode integration, install, and checkout process. Documentation will be developed during the original EDAAC system set-up/ integration, install and checkout in TS2 with redlines following during a second cleanup, install and checkout run in TS2. The redlines will be incorporated for the integration, install and checkout in TS1 mode. These documents will be packaged for the PSR for all DAACs.

## 5.3 Integration Testing and Interface Verification Testing

The ECS interfaces with ECS PDS will be verified, first, by simulating orders after test executables have been installed and again during the checkout phase of the ECS PDS integration and installation at each DAAC. As PDSIS and PSA-SA components pass the unit test phase, they will be integrated and installed so the test process so the segment/thread integration test can beginning. EDAAC and EDAAC ECS will integrate these components in the EDAAC ECS test modes, where the build/thread test activities will be performed. The components will be used to support functional thread development tests as well as full integration tests, to include System Testing and Acceptance Test.

## 5.4 ECS Interface Regression Testing

As ECS interface components pass the unit test phase, they are submitted to the segment integration and test (I&T) organization. I&T will integrate these components in the ECS Engineering Development Facility (EDF) in Landover, Maryland, where the build/thread activities are performed. The components will be used to support functional thread development and test, leading to the integration of threads into release-specific builds. The I&T organization will regression test these interfaces with simulated information and verify some of the requirements defined in the ESDIS ticket. This information will be documented and provided in test reports available for the ECS PDS PSR.

ECS PDS Interface Test Executables installation testing will happen at each DAAC following the PSR for the PDS Test Executable. The Test Executables should be installed and tested by the DAACs with simulated orders to verify that the PDS TEs are working and configured.

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# 6. ECS PDS Release Process

This section describes the ECS PDS deployment/release process including the Pre-Ship Review (PSR), installation, integration and test, training, turnover to the DAACs, sustainment, and follow-on options.

## 6.1 PSR

The ECS Deployment process will be used to distribute the ECS PDS baseline to the DAACs. Pre-Ship Review will be completed in accordance with current ECS deployment practices. The PSR shall be done in accordance with ECS Project Instructions. EDAAC will work with ECS deployment and test to provide the documentation necessary to support a PSR walk through and a PSR for ECS PDS delivery to the ECS DAACs. EDAAC will complete system set-up, installation, checkout, system test, acceptance test, and operational concept documentation for the PSR as initial development testing is on going. EDAAC will use a pre-integration version of the PDS Test Executable to support initial testing. The ESC PDS Test Executable will be considered as part of the ECS PDS PSR; however, they are separate configuration items and they should be installed as soon as possible to support the ECS PDS set up, integration and installation process. ECS PDS Interface Test Executables delivered by the ECS Development Facility in Landover, MD should be installed and tested by the DAAC with simulated orders to verify that the PDS TEs are working and configured. This install and test process should happen prior to the arrival of the EDAAC PDS support team to set up the hardware, when appropriate. Other ECS machines may be used to test configuration in the test mode prior to actual PDS Hardware arrival.

## 6.2 Installation and Checkout

The ECS PDS installation documentation will be built from system set-up information through ECS integration. The installation documentation will be built from PDS-SA, PDSIS, and EDAAC ECS integration, and be refined/redlined as these efforts proceed through development at EDAAC. Integration, installation and checkout of the ECS PDS system (ECS I/Fs and Test Executables, PDS GOTS, PDSIS) will be completed by the EDAAC ECS PDS development team with support from the EDAAC ECS system support group. Integration, installation, and checkout documentation will be developed, review, and redlined via the EDAAC test mode integration, install, and checkout process. Documentation will be developed during the original EDAAC system set-up/ integration, install and checkout in TS2 with redlines following during a second cleanup, install and checkout run in TS2. The redlines will be incorporated for the integration, install and checkout in TS1 mode. These documents will be packaged for the PSR for all DAACs. These documents will also be updated in conjunction with the PSR process for ECS PDS. The system set-up process will be documented and provided during the PSR for all DAACs via verification during the ECS PDS system set-up, burn-in, integration, and install on each DAAC's ECS PDS hardware. The checkout will include bringing up all ECS PDS

associated servers and running search and orders representative of the major product types for the DAAC in question.

## 6.3 System Test

As components pass the installation and checkout phase, they will enter the full integration test process, to include System Testing and Acceptance Test. After formal delivery of the ECS PDS code through the PSR process, the integration of the code happens during the install process. Checkout testing, System testing, and Acceptance testing will follow at each DAAC. An ECS PDS Test document will be developed and provided to the ECS DAACs.

### 6.3.1 Integration and Installation Testing

The checkout test at each DAAC will consist of the same type of testing used during the checkout of the previous 8mm media distribution thread. Each DAAC will run a scenario consisting of a search and order for representative DAAC media products.

### 6.3.2 System Test/End to End Testing

The ECS PDS Systems Test will consist of testing to verify ESDIS Ticket Requirements via running search and order segments related to specific physical media product orders related to the DAAC in which the test is being run. ECS PDS will be tested at each DAAC via running end-to-end order and distribution scenarios for representative product types at each DAAC for each type of media. The End-to-End Test will be supported by ECS Test and IV&V test plans to perform on-site End-to-End (ETE) testing.

### 6.3.3 Acceptance Testing

The ECS PDS Acceptance Test will represent the order and distribution requirements being used for the Release 6A performance verification as defined in the Drop 6A Test documents. The test will consist of executing two 24 hour sustained operation test periods, consisting of a dry run test and a final test using workloads that approximate each DAACs representative media distribution requirement. The tests will be run consecutively with up to a one day troubleshooting period between the dry run and the final test at each DAAC.

## 6.4 Training

The training plan for PDS is split into 3 segments. The first segment is called System Set-up and Administration Training. This segment consists of training key systems personnel on how to set-up and configures the PDS hardware and installation and configuration of the PDS COTS and custom software in order to prepare for system integration. This training will be accomplished by having EDAAC CSB and EDAAC ECS personnel involved in the set-up, install, and configuration of EDAAC PDS hardware and software. Documentation of this process will be done in order to support the set-up, install, and configuration of GSFC PDS hardware and software. During the set-up, install, and configuration of GSFC PDS hardware and software, key personnel from the DAACs and ECS will invite to attend and learn the process in order to provide support of the PDS during and after the install at the respective facilities. This training

will occur during the system set-up and hardware integration phase. Hardware and System Administration support staff will be key during this first segment of training.

The second segment of training is called System Support Training. This segment of training is provided in order to support the ECS PDS system operationally at the DAACs and the ECS facility. This training will be focused on providing the engineering staff, Software Maintenance Engineering, System Engineering, and Test Engineering, an understanding of the ECS PDS system and the interfaces. It will provide an understanding of the operation flow of the ECS PDS and troubleshooting training. It will also provide an understanding of software installation and configuration, and system checkout and test. This training will occur during the installation and checkout phase of the program. This training will first occur at EDC during the installation and integration phase, with subsequent training occurring at the other facilities. The EDC installation will be used as a training and documentation ground for future training.

The third segment of training is called System Operations Training, and is related to providing the system operations staff an understanding of the system flow and how the system works operationally. This training will occur during the system checkout and acceptance test phases of the program. The operators will be training during the checkout window and will receive hands on training by running the acceptance test at each facility. The super users for the operations staff will be invite to EDC to help with the initial training, and provide feedback and documentation review for follow –on training at EDC and the other facilities. The ECS training organization will be key in organizing and training the operators during this training period. The ECS Training staff will invite to attend all 3 training segments on order to obtain and understanding of the ECS PDS system and helping document key materials of training.

Oracle database training will be need for the installation and setup of Oracle. EDAAC development personnel will do install instructions and training of associated system and database administrators. Additional COTS training for database personnel can be obtained as necessary for database personnel who will be sustaining development and maintenance of the system. Personnel that may be developing specific product modules in the future may want to consider some additional Oracle training.

## 6.5 ECS PDS Turnover

The ECS PDS system will be turned over to the DAACs upon completion of the acceptance test at each facility. The ECS PDS development staff is responsible for making sure that the system is set up and working at each facility; however, this staff is relying highly on the DAAC staff to implement and support the integration and test at the respective facility. This is an essential component of the system support personnel training. The ECS PDS development staff will provide technical support after the turnover but it is expected that the DAACs staff will continue testing and moving the system toward the operation environment. The

## 6.6 ECS PDS Sustainment

The ECS PDS program will follow the ECS Program Configuration model where all baseline changes are tracked via TT/NCR and/or CCR. ECS PDS developmental changes after PSR will

be delivered via a CCR process to ECS via the ECS PDS IPT, or the M&O CCB. Prior to the PSR development change requests will be tracked via the EDC EDAAC CM process. All DAAC unique changes shall be provide to ECS for baseline purposes. The ECS help desk will be utilized for all questions and TTs. EDAAC will provide technical support via the ECS M&O sustaining engineering group, as required.

## 6.7 ECS PDS Follow-on Options

The final section of the ECS PDS program plan provides insight into future ECS PDS developmental efforts. Each release of the ECS will contains more functionality, and in later releases, technology enhancements are planned.

A brief explanation of the changes and impact needed to carry the 5B integration approach into 6A is as follows: The impact of using the FRONTEND solution for integrating PDS with ECS 6A includes the following:

- 6Aand 5B baselines differ in some important aspects because the 6A baseline contains the support for the new media options and obtaining them from the Registry.
- 6A and 5B also have very different DDIST software baselines.
- The Registry implementation for media types does not support server specific media type configurations.

Though the scenarios will remain essentially the same in 6A as in 5B, the following capabilities will require a substantially different implementation:

- **INFR**: The Registry interface needs to support the specification and retrieval of media options similar to how it handles other configuration parameters. The intent will be to specify FTP Push and FTP Pull as the generic media option configurations; and FTP Push, FTP Pull plus the hard media types specifically for the V0 GTWAY.
- **GTWAY**: Two options for implementing the GTWAY capabilities are under considerations.
    + The first and preferred alternative is to integrate the 6A GTWAY with 5B ECS. This would require some minor changes to stub out the Registry interface and read the distribution options from a file (similar to what the 5B version does).
    + The second alternative is to make the GTWAY changes to both the 5B and 6A versions of the GTWAY. The 5B version obtains the distribution options from a file; the 6A version obtains them from the registry. This option is less desirable because implementing the PDSIS interface is easier in 6A, and different from the manner in which it is implemented in 5B (i.e., requiring more development effort)
- **DDIST**: will need to re-implement the capabilities listed in Section 2.1 for its 6A baseline.
- **DDM**: The 5B version of the DDM OTIS script will not require changes to work with 6A.

- **CLS**: the 5B changes to ODFRM would not need to be transferred to 6A. The 6A version of the ODFRM will obtain the permitted distribution options from the (generic branch of the) registry.

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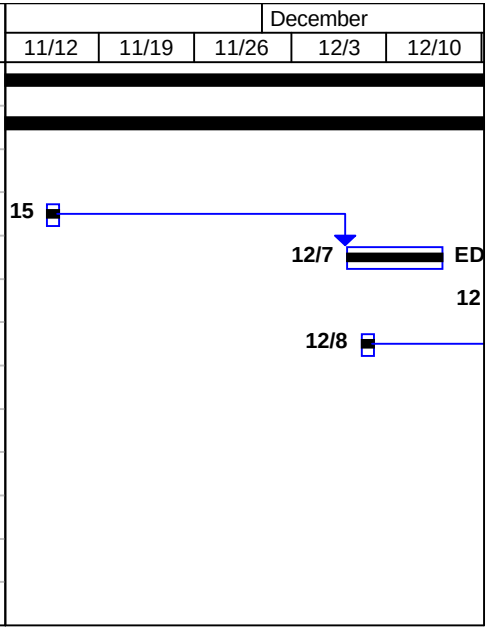
# Appendix A. Abbreviations and Acronyms

| | |
|---|---|
| CD | Compact Disc |
| CD-ROM | Compact Disc Read-Only Memory |
| CIR | Color Infrared |
| COTS | Custom off the Shelf |
| CSB | Computer Services Branch |
| DAAC | Distributed Active Archive Center |
| DFCB | Data Format Control Book |
| DOI | Department of Interior |
| DORRAN | Distributed Ordering Research & Accounting Network |
| DVD | Digital Versatile Disc |
| ECS | EOSDIS Core System |
| EDC | EROS Data Center |
| EDF | ECS Development Facility |
| EOSDIS | Earth Observing System Data Information System |
| EROS | Earth Resources Observation System |
| ESDIS | Earth Science Data Information System |
| ESIC | Earth Science Information Center |
| FIFO | first-in first-out |
| FTP | File Transfer Protocol |
| GOTS | Government off the Shelf |
| HDF-EOS | Hierarchical Data Format- Earth Observing Systems |
| MTTR | Mean Time To Restore |
| PDS | Product Distribution System |
| PDSIS | Product Distribution System Information Server |
| PDSSA | Product Distribution System – Stand Alone |
| TBD | To Be Determined |

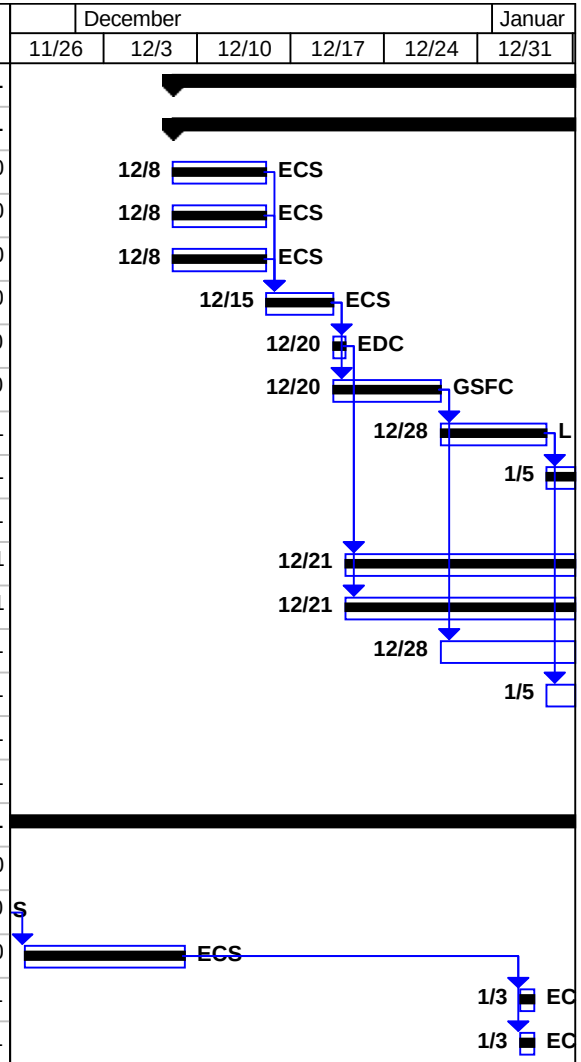
| | |
|---|---|
| USGS | United States Geological Survey |

# Appendix B. ECS PDS Integrated Program Schedule

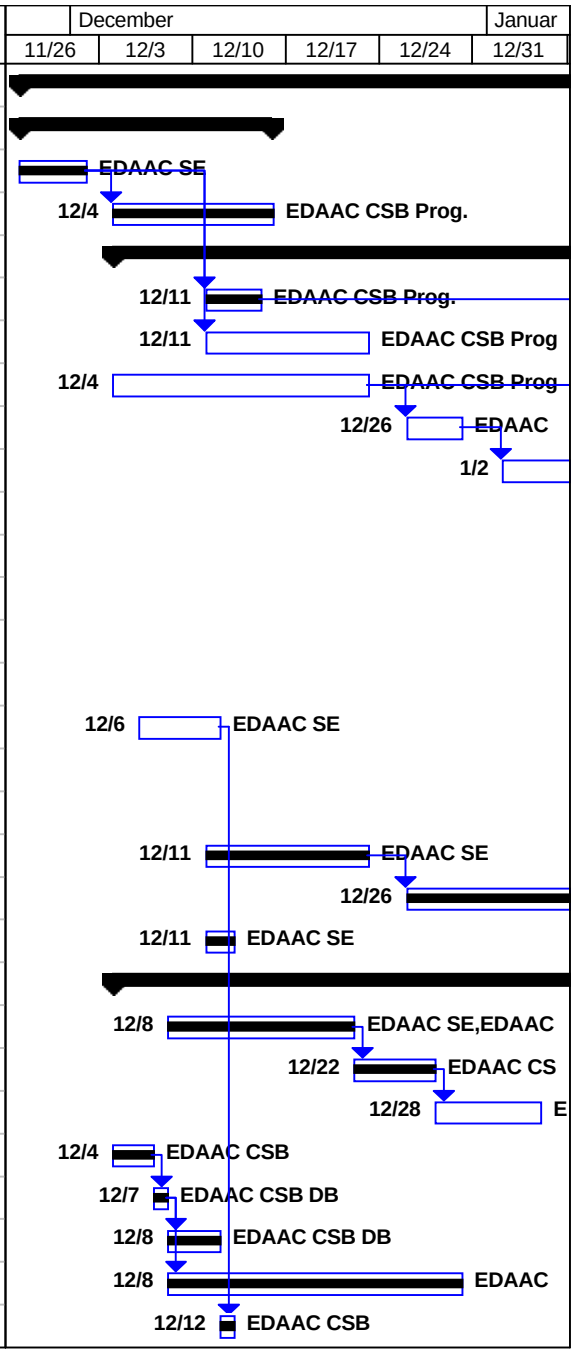
| ID | Task Name | Duration | Start | Finish |
|---|---|---|---|---|
| 1 | **ECS PDS System** | **116 days** | **Mon 11/6/00** | **Tue 4/24/01** |
| 2 | **Project Dates** | **114 days** | **Wed 11/8/00** | **Tue 4/24/01** |
| 3 | ESDIS Program Approval | 1 day | Wed 11/8/00 | Wed 11/8/00 |
| 4 | Kickoff Meeting | 1 day | Wed 11/15/00 | Wed 11/15/00 |
| 5 | Baseline Program Plan and Schedule | 5 days | Thu 12/7/00 | Wed 12/13/00 |
| 6 | Facilities Requirements defined | 1 day | Wed 12/20/00 | Wed 12/20/00 |
| 7 | Create Development Environment | 1 day | Fri 12/8/00 | Fri 12/8/00 |
| 8 | Testbed Hardware Set-up Complete @ EDAAC | 1 day | Wed 3/7/01 | Wed 3/7/01 |
| 9 | Program Review 1 at Landover | 2 days | Wed 1/17/01 | Thu 1/18/01 |
| 10 | Integrate Install & Test Documents for PSR | 2 days | Thu 3/15/01 | Fri 3/16/01 |
| 11 | Pre-Ship Review for DAACs | 1 day | Mon 3/19/01 | Mon 3/19/01 |
| 12 | PDS Integration (acceptance test) complete at DAACs | 1 day | Tue 4/17/01 | Tue 4/17/01 |
| 13 | Completion of PDS Phase 1- delivery to DAACs | 1 day | Tue 4/24/01 | Tue 4/24/01 |



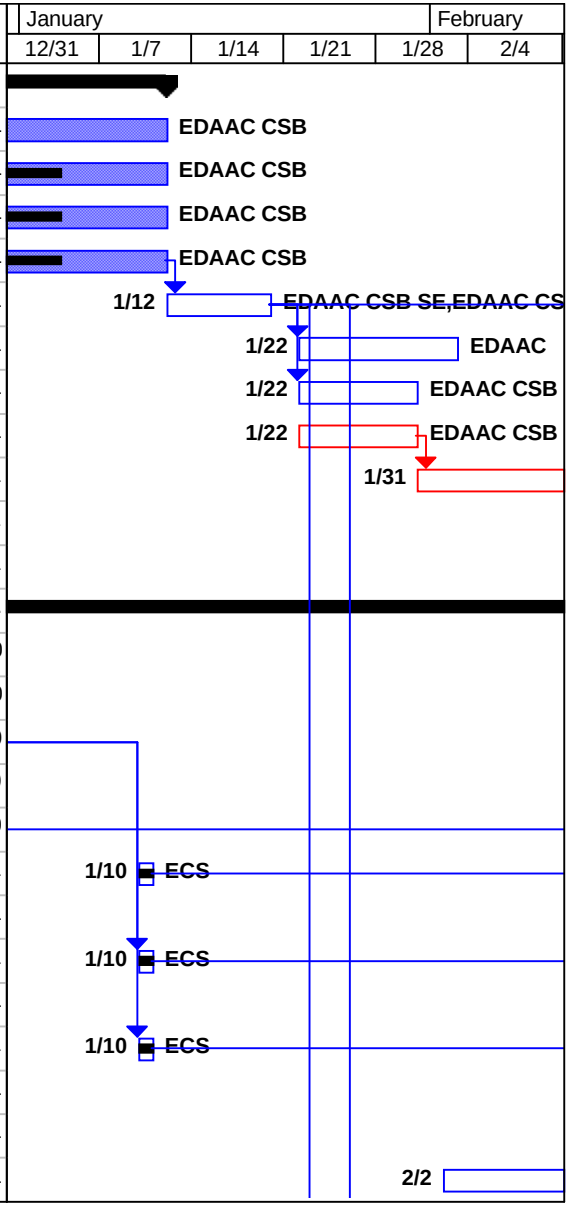
| ID | Task Name | Duration | Start | Finish |
|---|---|---|---|---|
| 14 | **PDS Facility requirements** | **48 days** | **Fri 12/8/00** | **Fri 2/16/01** |
| 15 | **ECS provided equipment footprint delivered** | **28 days** | **Fri 12/8/00** | **Fri 1/19/01** |
| 16 | Power | 5 days | Fri 12/8/00 | Thu 12/14/00 |
| 17 | Equipment Footprint | 5 days | Fri 12/8/00 | Thu 12/14/00 |
| 18 | Network | 5 days | Fri 12/8/00 | Thu 12/14/00 |
| 19 | Documentation | 3 days | Fri 12/15/00 | Tue 12/19/00 |
| 20 | ECS DAAC facilities requirements understood at EDAAC | 1 day | Wed 12/20/00 | Wed 12/20/00 |
| 21 | ECS DAAC facilities requirements understood at GDAAC | 5 days | Wed 12/20/00 | Wed 12/27/00 |
| 22 | ECS DAAC facilities requirements understood at LDAAC | 5 days | Thu 12/28/00 | Thu 1/4/01 |
| 23 | ECS DAAC facilities requirements understood at NDAAC | 5 days | Fri 1/5/01 | Thu 1/11/01 |
| 24 | ECS DAAC facilities requirements understood at ECS | 5 days | Fri 1/12/01 | Fri 1/19/01 |
| 25 | Pre-hardware set up at EDC | 4 wks | Thu 12/21/00 | Mon 1/22/01 |
| 26 | Pre-hardware set-up at EDC computer 3 | 5 wks | Thu 12/21/00 | Mon 1/29/01 |
| 27 | Pre-hardware set up at GSFC | 5 wks | Thu 12/28/00 | Fri 2/2/01 |
| 28 | Pre-hardware set up at NSIDC | 5 wks | Fri 1/5/01 | Fri 2/9/01 |
| 29 | Pre-hardware set up at LaRC | 5 wks | Fri 1/12/01 | Fri 2/16/01 |
| 30 | Pre-hardware set up at ECS Landover | 4 wks | Mon 1/22/01 | Fri 2/16/01 |
| 31 | **PDS Hardware delivery** | **62 days** | **Thu 11/16/00** | **Fri 2/16/01** |
| 32 | BOM delivered to ECS | 1 day | Thu 11/16/00 | Thu 11/16/00 |
| 33 | BOM refined | 1 day | Wed 11/22/00 | Wed 11/22/00 |
| 34 | ECS purchase equipment for EDC and GSFC | 10 days | Mon 11/27/00 | Fri 12/8/00 |
| 35 | Delivery of EDC PDS Hardware to EDC | 1 day | Wed 1/3/01 | Wed 1/3/01 |
| 36 | Delivery of PDS Hardware 2 (GSFC) | 1 day | Wed 1/3/01 | Wed 1/3/01 |
| 37 | ECS purchase equipment for LaRC and NSIDC | 15 days | Fri 1/12/01 | Fri 2/2/01 |
| 38 | Delivery of PDS Hardware 3 (NSIDC) | 1 day | Mon 2/5/01 | Mon 2/5/01 |
| 39 | Delivery of PDS Hardware 4 (LaRC) | 1 day | Mon 2/5/01 | Mon 2/5/01 |
| 40 | BOM refined for ECS Landover | 1 day | Tue 1/16/01 | Tue 1/16/01 |
| 41 | BOM approved for ECS Landover | 5 days | Wed 1/17/01 | Tue 1/23/01 |
| 42 | ECS purchase equipment for ECS Landover | 15 days | Wed 1/24/01 | Tue 2/13/01 |
| 43 | Delivery of PDS Hardware 5 (ECS Landover) | 1 day | Fri 2/16/01 | Fri 2/16/01 |



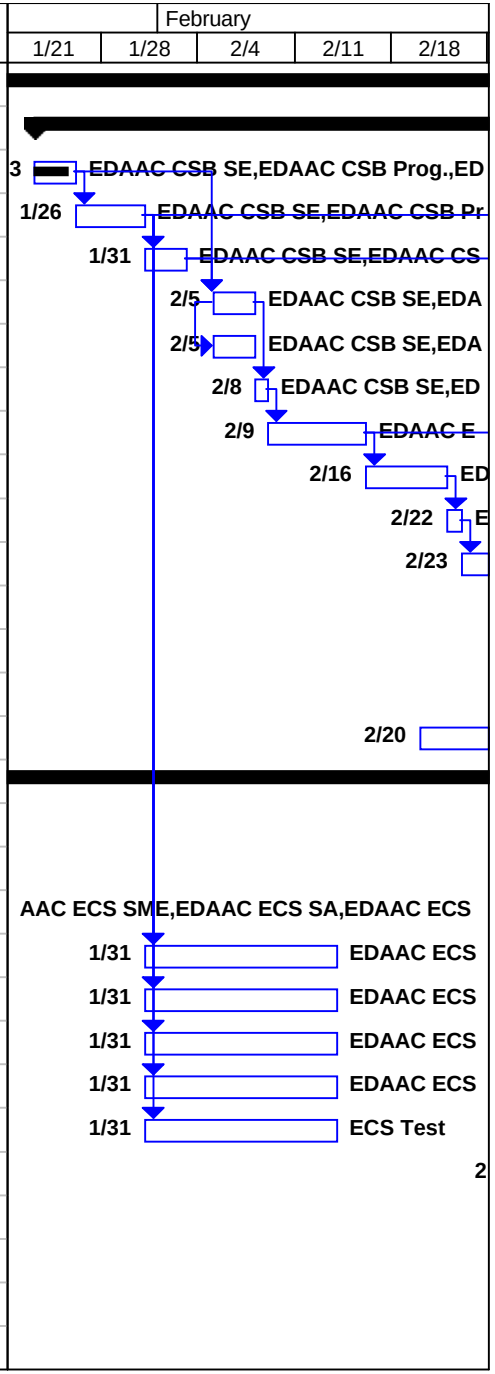
| ID | Task Name | Duration | Start | Finish |
|---|---|---|---|---|
| 44 | **PDS Input Server** | **63 days** | **Mon 11/27/00** | **Tue 2/27/01** |
| 45 | **Documentation** | **15 days** | **Mon 11/27/00** | **Fri 12/15/00** |
| 46 | System Requirements/Spec | 5 days | Mon 11/27/00 | Fri 12/1/00 |
| 47 | Design Document Completed | 10 days | Mon 12/4/00 | Fri 12/15/00 |
| 48 | **Development** | **58 days** | **Mon 12/4/00** | **Tue 2/27/01** |
| 49 | Develop Interface Simulator | 4 days | Mon 12/11/00 | Thu 12/14/00 |
| 50 | Server Component Set-up | 10 days | Mon 12/11/00 | Fri 12/22/00 |
| 51 | ODL Parser component | 15 days | Mon 12/4/00 | Fri 12/22/00 |
| 52 | Database Set-up | 4 days | Tue 12/26/00 | Fri 12/29/00 |
| 53 | Acquire Product component | 10 days | Tue 1/2/01 | Tue 1/16/01 |
| 54 | Email Parser component | 5 days | Wed 1/17/01 | Tue 1/23/01 |
| 55 | Staging Disk Clean Up | 3 days | Wed 1/24/01 | Fri 1/26/01 |
| 56 | Shipping Label Component | 2 days | Mon 1/29/01 | Tue 1/30/01 |
| 57 | MSS Status component | 3 days | Mon 1/29/01 | Wed 1/31/01 |
| 58 | PDSIS GUI Manager (error/recovery) | 10 days | Thu 2/1/01 | Wed 2/14/01 |
| 59 | Define Requirements for Product Modules | 4 days | Wed 12/6/00 | Mon 12/11/00 |
| 60 | Code Integration and Test with simulator | 5 days | Thu 2/15/01 | Thu 2/22/01 |
| 61 | Software Packaging & Documentation | 3 days | Fri 2/23/01 | Tue 2/27/01 |
| 62 | Requirements CD Label | 2 wks | Mon 12/11/00 | Fri 12/22/00 |
| 63 | Requirements CD Insert | 2 wks | Tue 12/26/00 | Tue 1/9/01 |
| 64 | Requirements for Tape Labels | 2 days | Mon 12/11/00 | Tue 12/12/00 |
| 65 | **PDS GOTS** | **69 days** | **Mon 12/4/00** | **Wed 3/14/01** |
| 66 | Requirements and Specification Documents | 2 wks | Fri 12/8/00 | Thu 12/21/00 |
| 67 | PDS Internal ICD | 3 days | Fri 12/22/00 | Wed 12/27/00 |
| 68 | PDS System Configuration | 1 wk | Thu 12/28/00 | Thu 1/4/01 |
| 69 | Create Dev Sys Environment | 3 days | Mon 12/4/00 | Wed 12/6/00 |
| 70 | Install Oracle | 1 day | Thu 12/7/00 | Thu 12/7/00 |
| 71 | Rehost PDS Oracle DB Table (copy) | 2 days | Fri 12/8/00 | Mon 12/11/00 |
| 72 | Integrate Oracle Forms | 15 days | Fri 12/8/00 | Fri 12/29/00 |
| 73 | Get Requirements for Product Modules | 1 day | Tue 12/12/00 | Tue 12/12/00 |



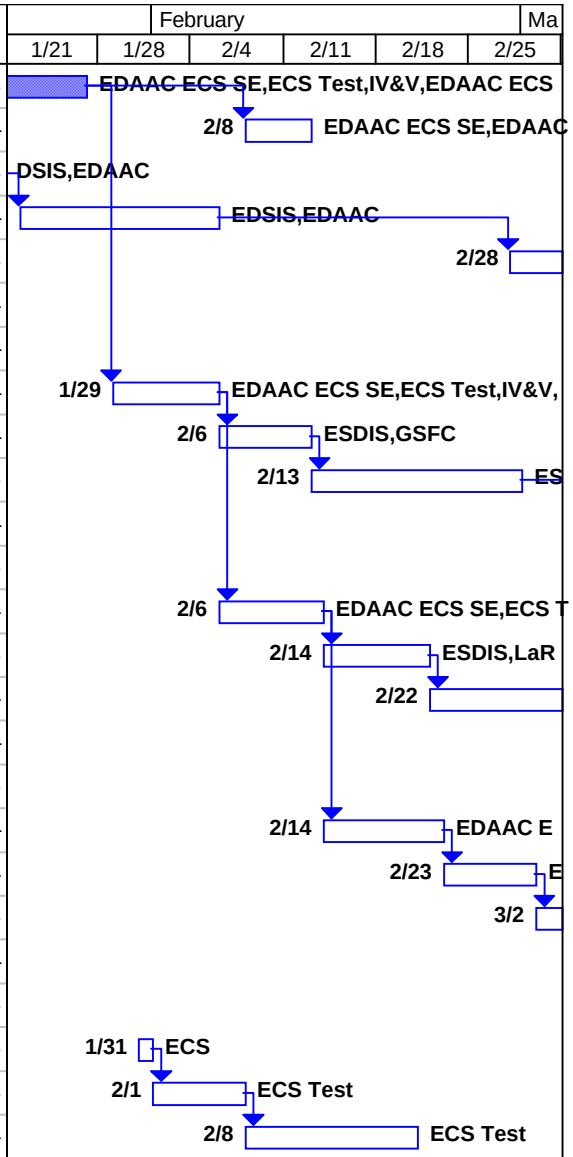
| ID | Task Name | Duration | Start | Finish |
|---|---|---|---|---|
| 74 | **Develop Product Module** | **20 days** | **Wed 12/13/00** | **Thu 1/11/01** |
| 75 | Develop Product Module | 20 days | Wed 12/13/00 | Thu 1/11/01 |
| 76 | Develop CD Labels | 12 days | Tue 12/26/00 | Thu 1/11/01 |
| 77 | Develop CD Insert | 12 days | Tue 12/26/00 | Thu 1/11/01 |
| 78 | Develop Tape Labels | 12 days | Tue 12/26/00 | Thu 1/11/01 |
| 79 | Unit Code Testing | 5 days | Fri 1/12/01 | Fri 1/19/01 |
| 80 | Develop Other DAAC Product Modules | 10 days | Mon 1/22/01 | Fri 2/2/01 |
| 81 | Package PDS Standalone S/W and System Documentation | 7 days | Mon 1/22/01 | Tue 1/30/01 |
| 82 | Standard Operator Procedures and documentation | 7 days | Mon 1/22/01 | Tue 1/30/01 |
| 83 | Preliminary Super User Procedures and documentation | 3 wks | Wed 1/31/01 | Wed 2/21/01 |
| 84 | Final Super User Procedures and documentation | 2 wks | Thu 2/22/01 | Wed 3/7/01 |
| 85 | Complete Install Documentation | 5 days | Thu 3/8/01 | Wed 3/14/01 |
| 86 | **ECS Interface Information** | **74 days** | **Mon 11/6/00** | **Fri 2/23/01** |
| 87 | Requirements definition | 1 day | Mon 11/6/00 | Mon 11/6/00 |
| 88 | I/F Spec delivered | 1 day | Mon 11/13/00 | Mon 11/13/00 |
| 89 | ICD review complete | 11 days | Tue 11/14/00 | Thu 11/30/00 |
| 90 | ICD complete | 4 days | Fri 12/1/00 | Wed 12/6/00 |
| 91 | Deliver Preliminary SCLI code and documentation | 1 day | Fri 12/8/00 | Fri 12/8/00 |
| 92 | Deliver Pre-integration SCLI code and documentation | 1 day | Wed 1/10/01 | Wed 1/10/01 |
| 93 | Deliver Final SCLI code and documentation | 1 day | Tue 2/20/01 | Tue 2/20/01 |
| 94 | Deliver Preliminary DMS V0GW and documentation | 1 day | Wed 1/10/01 | Wed 1/10/01 |
| 95 | Deliver Final DMS V0GW and documentation | 1 day | Tue 2/20/01 | Tue 2/20/01 |
| 96 | Deliver Preliminary DDIST/MSS Order Status Update and doc | 1 day | Wed 1/10/01 | Wed 1/10/01 |
| 97 | Deliver Final DDIST/MSS Order Status Update and document | 1 day | Tue 2/20/01 | Tue 2/20/01 |
| 98 | Obtain Install Information for PSR | 3 days | Wed 2/21/01 | Fri 2/23/01 |
| 99 | ECS PDS System Integration & I/F Test in VATC for TEs | 15 days | Fri 2/2/01 | Fri 2/23/01 |



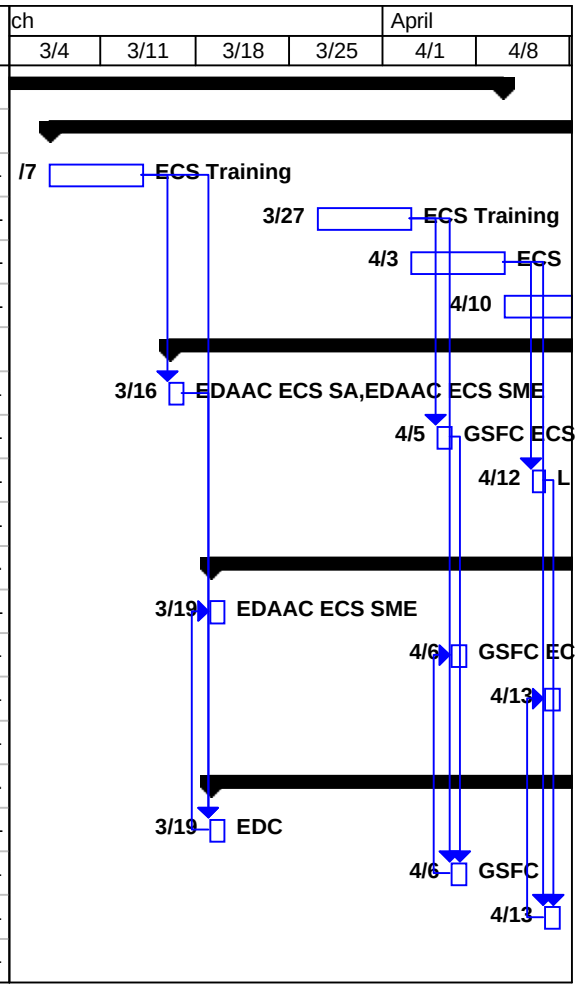
| ID | Task Name | Duration | Start | Finish |
|---|---|---|---|---|
| 100 | **PDS System Integration** | **92 days** | **Mon 12/11/00** | **Mon 4/23/01** |
| 101 | **PDS GOTS/COTS System Integration and Set Up** | **36 days** | **Tue 1/23/01** | **Wed 3/14/01** |
| 102 | EDC System Set Up/Burn in/SW Install at EDC | 3 days | Tue 1/23/01 | Thu 1/25/01 |
| 103 | EDC Install Checkout Test | 3 days | Fri 1/26/01 | Tue 1/30/01 |
| 104 | Document System Install and Test | 3 days | Wed 1/31/01 | Fri 2/2/01 |
| 105 | GSFC System Set Up/Burn in/SW Install at EDC | 3 days | Mon 2/5/01 | Wed 2/7/01 |
| 106 | Training of Key Personnel (Train the Trainer) | 3 days | Mon 2/5/01 | Wed 2/7/01 |
| 107 | GSFC Install Checkout Test | 1 day | Thu 2/8/01 | Thu 2/8/01 |
| 108 | GSFC system Teardown at EDC and shipping to GSFC | 5 days | Fri 2/9/01 | Thu 2/15/01 |
| 109 | NSIDC System Set Up/Burn in/SW Install at EDC | 3 days | Fri 2/16/01 | Wed 2/21/01 |
| 110 | NSIDC Install Checkout Test | 1 day | Thu 2/22/01 | Thu 2/22/01 |
| 111 | NSIDC System Teardown at EDC and shipping to NSIDC | 5 days | Fri 2/23/01 | Thu 3/1/01 |
| 112 | LaRC System Set Up/Burn in/SW Install at EDC | 3 days | Fri 3/2/01 | Tue 3/6/01 |
| 113 | LaRC Install Checkout Test | 1 day | Wed 3/7/01 | Wed 3/7/01 |
| 114 | LaRC System Teardown at EDC and shipping to LaRC | 5 days | Thu 3/8/01 | Wed 3/14/01 |
| 115 | PDS HW set UP/Burn in VATC | 5 days | Tue 2/20/01 | Mon 2/26/01 |
| 116 | **PDS Integration with ECS Test Mode** | **87 days** | **Mon 12/11/00** | **Mon 4/16/01** |
| 117 | Install ECS SCLI in TS2 for PDSIS development | 5 days | Mon 12/11/00 | Fri 12/15/00 |
| 118 | Integrate ECS with SG23 | 2 days | Mon 12/18/00 | Tue 12/19/00 |
| 119 | Install ECS V0GW and MSS/DDIST TEs in TS2 | 5 days | Thu 1/11/01 | Thu 1/18/01 |
| 120 | Write EDAAC Checkout Procedures | 10 days | Wed 1/31/01 | Tue 2/13/01 |
| 121 | Write GSFC Checkout Procedures | 10 days | Wed 1/31/01 | Tue 2/13/01 |
| 122 | Write NSIDCC Checkout Procedures | 10 days | Wed 1/31/01 | Tue 2/13/01 |
| 123 | Write LaRC Checkout Procedures | 10 days | Wed 1/31/01 | Tue 2/13/01 |
| 124 | Write VATC Checkout Test | 10 days | Wed 1/31/01 | Tue 2/13/01 |
| 125 | Integration, Install & Checkout of PDS/PDSIS/ECS at EDC | 5 days | Wed 2/28/01 | Tue 3/6/01 |
| 126 | Integration, Install & Checkout at GSFC | 5 days | Tue 3/20/01 | Mon 3/26/01 |
| 127 | Integration, Install & Checkout at NSIDC | 5 days | Tue 3/27/01 | Mon 4/2/01 |
| 128 | Integration, Install & Checkout at LaRC | 5 days | Tue 4/3/01 | Mon 4/9/01 |
| 129 | Integration, Install & Checkout at VATC | 5 days | Tue 4/10/01 | Mon 4/16/01 |



| ID | Task Name | Duration | Start | Finish |
|---|---|---|---|---|
| 141 | Develop EDC System/Acceptance Test Procedures | 20 days | Thu 12/28/00 | Fri 1/26/01 |
| 142 | TS2 System Test@EDAAC | 3 days | Thu 2/8/01 | Mon 2/12/01 |
| 143 | Approval of EDC Test Procedues | 5 days | Fri 1/12/01 | Fri 1/19/01 |
| 144 | Approval of EDC Test Procedues by ESDIS | 11 days | Mon 1/22/01 | Mon 2/5/01 |
| 145 | TS2 System Test re-do @EDAAC | 5 days | Wed 2/28/01 | Tue 3/6/01 |
| 146 | SystemTest/Acceptance Test at EDC (dry run/final) | 5 days | Wed 3/7/01 | Tue 3/13/01 |
| 147 | EDC Acceptance Test Report | 2 days | Wed 3/14/01 | Thu 3/15/01 |
| 148 | Develop GSFC System/Acceptance Test Procedures | 6 days | Mon 1/29/01 | Mon 2/5/01 |
| 149 | Approval of GSFC Test Procedues | 5 days | Tue 2/6/01 | Mon 2/12/01 |
| 150 | Approval of GSFC Test Procedues by ESDIS | 11 days | Tue 2/13/01 | Wed 2/28/01 |
| 151 | SystemTest/Acceptance Test at GSFC (dry run/final) | 5 days | Tue 3/27/01 | Mon 4/2/01 |
| 152 | GSFC Acceptance test report | 2 days | Tue 4/3/01 | Wed 4/4/01 |
| 153 | Develop NSIDC System/Acceptance Test Procedures | 6 days | Tue 2/6/01 | Tue 2/13/01 |
| 154 | Approval of NSIDC Test Procedues | 5 days | Wed 2/14/01 | Wed 2/21/01 |
| 155 | Approval of NSIDC Test Procedues by ESDIS | 11 days | Thu 2/22/01 | Thu 3/8/01 |
| 156 | SystemTest/Acceptance at NSIDC (dry run/final) | 5 days | Tue 4/3/01 | Mon 4/9/01 |
| 157 | NSIDC Acceptance test report | 2 days | Tue 4/10/01 | Wed 4/11/01 |
| 158 | Develop NSIDC System/Acceptance Test Procedures | 6 days | Wed 2/14/01 | Thu 2/22/01 |
| 159 | Approval of LaRC Test Procedues | 5 days | Fri 2/23/01 | Thu 3/1/01 |
| 160 | Approval of LaRC Test Procedues by ESDIS | 11 days | Fri 3/2/01 | Fri 3/16/01 |
| 161 | SystemTest/Acceptance at LaRC (dry run/final) | 5 days | Tue 4/10/01 | Mon 4/16/01 |
| 162 | LaRC Acceptance test report | 2 days | Tue 4/17/01 | Wed 4/18/01 |
| 163 | PDS Informal Turnover to ECS Test | 1 day | Wed 1/31/01 | Wed 1/31/01 |
| 164 | VATC Install & Checkout | 5 days | Thu 2/1/01 | Wed 2/7/01 |
| 165 | VATC Regression Tests | 8 days | Thu 2/8/01 | Tue 2/20/01 |
| 166 | SystemTest/Acceptance at VATC/PVC | 5 days | Tue 4/17/01 | Mon 4/23/01 |



| ID | Task Name | Duration | Start | Finish |
|---|---|---|---|---|
| 167 | **PDS System Training at DAACs** | **29 days** | **Wed 2/28/01** | **Mon 4/9/01** |
| 172 | **PDS Operator Training** | **29 days** | **Wed 3/7/01** | **Mon 4/16/01** |
| 173 | EDC Training | 5 days | Wed 3/7/01 | Tue 3/13/01 |
| 174 | GSFC & LandoverTraining | 5 days | Tue 3/27/01 | Mon 4/2/01 |
| 175 | NSIDC Training | 5 days | Tue 4/3/01 | Mon 4/9/01 |
| 176 | LaRC Training | 5 days | Tue 4/10/01 | Mon 4/16/01 |
| 177 | **PDS Integration with ECS OPS** | **25 days** | **Fri 3/16/01** | **Thu 4/19/01** |
| 178 | Integration of PDS/PDSIS/ECS at EDC | 1 day | Fri 3/16/01 | Fri 3/16/01 |
| 179 | Integration & Install at GSFC | 1 day | Thu 4/5/01 | Thu 4/5/01 |
| 180 | Integration & Install at NSIDC | 1 day | Thu 4/12/01 | Thu 4/12/01 |
| 181 | Integration & Install at LaRC | 1 day | Thu 4/19/01 | Thu 4/19/01 |
| 182 | **EcDmGwPackage.dat Update for Media Type in OPS** | **25 days** | **Mon 3/19/01** | **Fri 4/20/01** |
| 183 | Change file at EDC | 1 day | Mon 3/19/01 | Mon 3/19/01 |
| 184 | Change file at GSFC | 1 day | Fri 4/6/01 | Fri 4/6/01 |
| 185 | Change file at NSIDC | 1 day | Fri 4/13/01 | Fri 4/13/01 |
| 186 | Change file at LaRC | 1 day | Fri 4/20/01 | Fri 4/20/01 |
| 187 | **PDS Public** | **25 days** | **Mon 3/19/01** | **Fri 4/20/01** |
| 188 | EDC | 1 day | Mon 3/19/01 | Mon 3/19/01 |
| 189 | GSFC | 1 day | Fri 4/6/01 | Fri 4/6/01 |
| 190 | NSIDC | 1 day | Fri 4/13/01 | Fri 4/13/01 |
| 191 | LaRC | 1 day | Fri 4/20/01 | Fri 4/20/01 |



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# Appendix C. ESDIS Ticket: RM_5X_01

**Latest CCR Affecting this Ticket:**
**Latest CCR DATE Affecting this Ticket:**

# Ticket: RM_5X_01 (Without L4 Mappings) DRAFT

# Integration of the EDC Product Distribution System (PDS) with ECS

**Launch Criticality:** 5X
**Review:** DDIST, DMS, CLS, SDSRV
**Priority:** NO DATA
**Number of Tracked Ticket Changes:**

**Ticket CCR Number*:**
**Ticket CCR Date*:**
* Represents changes to information from Ticket table only. Does not include information linked in from other tables.

NOTE: The number of tracked changes (above) represents the number of changes to this particular Ticket. Whenever the data appearing in this Ticket changes this number is incremented by 1.

**External Interface Dependency:**
EDC Product Distribution System (PDS)

**Subsystem Dependency:**
DSS, DMS, CLS, SBSRV

**Preconditions:**

Creation of two MSS user profiles and e-mail addresses for Distribution Notifications, to be used by the test as the PDS profiles and the PDS e-mail addresses. The two-user profile ID must match the leader string for PDS profiles configured into DDIST.
Simulated DORRAN interface that acts as the sink for V0 ODL requests to DORRAN and the source of request responses; as well as providing for loop-back of Landsat orders.
Simulated PDS interface that acts as the target for V0 ODL requests to PDS and the source of request responses.

**Comments:**
This ticket represents interim changes in the support for additional physical media types by ECS that is necessitated by delays in the deployment of the original capability (RS_6A_01). The intent is to use the PDS for all physical media distributions in the interim. The ticket represents ECS capabilities to be integrated with ECS Release 5X. A

separate ticket defining the capabilities for 6A is under development. Additional enhancements are planned for Release 6B that will lift some of the constraints expressed in the requirements of this ticket.

The EDC PDS is considered an operational DAAC extension of the ECS. For this reason, the acceptance criteria formulated in this ticket do not include criteria that can only be verified through PDS-ECS integration testing. The PDS-ECS integration approach is still being negotiated with EDC. The operational concept and the Level 4 requirements in this ticket represent the approach that is currently considered the most desirable, but they are still subject to change. For additional information on the interfaces, their data flows and formats see the Interface Specification for Integration
of the EDC Product Distribution System (PDS) into the ECS (230-TP-002-XXX).

**Operational Concept:**

The 5BX operations concept has the ECS V0 Gateway (GTWAY) recognize orders for physical media. It will route such requests to the PDS rather than submit them to the SDSRV. Some time later and in anticipation of starting the physical media distribution for such a request, the PDS will order the data from ECS. The PDS will break up large orders into smaller sets, and in fact, may elect to order the granules in a request individually. The data will be staged by ECS via FTP to the PDS host, from where PDS will copy it onto the physical media. PDS is responsible for sending Distribution Notices to the users and creating other physical media related files such as the packing list.
Operators will use:

- the PDS operator interfaces to check on the status of a physical media request and control the physical media distribution
- the ECS operator interfaces to check on the status of a PDS data order

User Services can use the ECS order tracking GUI to check on the current status of a user request or order: the PDS will transfer certain order status changes (e.g., completion, failure) from its database to the ECS order tracking database to keep it up to date.
The following is a more detailed description of this concept.
For the ECS-PDS integration, the V0 GTWAY will be modified to forward physical media requests (i.e., requests other than FTP Push and FTP Pull) to the PDS in cases when it would submit them to the SDSRV now. It will do so after creating the ECS MSS order tracking information. The ECS V0 GTWAY does something similar today already: all Landsat requests coming from EDG are routed via DORRANN, and the V0 GTWAY will continue to do so.
The interface with the PDS will be socket based and use the same ODL message formats as the DORRAN interface. The forwarded requests will include the original order ID and request ID, UR (geOID) of the granules to be ordered, the shipping and contact information, and the physical media options (it would not include granule/order size). Note that the status of the ECS order and request are NULL at this point.
The PDS will parse the ODL and insert the request into the PDS request database. When ready to process the order, PDS will stage the data for distribution via an FTP Push data order that it will submit into ECS via the Science Data Server (SDSRV) Command Line Interface (SCLI). The PDS will request that the data be pushed to a disk staging area attached to the PDS host. At the large sites, the PDS host will be connected to the ECS HiPPI switch and ECS will perform the FTP across the HiPPI connection. The PDS will include a mechanism to pace the data orders it submits to ECS to prevent its staging disk from overfilling while keeping its physical media devices busy.
Upon submitting the data order to ECS, the PDS will provide as input:

- the FTP Push parameters, such as host, account, password, and directory
- the ID of a user profile reserved for PDS use so that ECS operators then can readily identify PDS orders on the ECS distribution screens
- the e-mail address to which ECS will send it's Distribution Notification (DN) for the data request and that is reserved for distribution notifications to the PDS.
- a USERSTRING parameter containing the original user Request ID and that will appear in any DN or Failed DN that ECS creates for the PDS data order; it can be used by operations to correlate a DN with the original request, should that prove necessary.
- the CLI tag parameter to support re-submission of requests in case of problems connecting with the SDSRV and which will include the original user request ID.

- the list of identifiers of the granules to be staged as provided to the PDS by the ECS GTWAY, starting with ESDT type (e.g., "SC:L70RWRS.001:2000022933").
- a request priority that the PDS will normally set to LOW, but which the PDS may elect to use to assign a higher priority to some of its data orders on occasion.
- optionally, Landsat floating scene subsetting parameters if the data order is for a floating scene subset; the PDS will never specify more than one granule in a data order for a Landsat floating scene subset.

From an ECS perspective, the data order submitted by the PDS via the SCLI will be separate from and unconnected with the original user order that was forwarded to the PDS by the GTWAY. The SCLI will submit the PDS data order via an ACQUIRE request to the SDSRV without creating MSS order tracking information. This ACQUIRE request will be handled by ECS independently of the original user order.
However, DDIST will be modified to display the USERSTRING on its operator screens. This will permit operators to determine for PDS requests that are currently being processed by ECS, the ID of the original user request.
SDSRV will not display such information on its operator GUI. However, an ECS rpcID will be derived from the SCLI tag parameter. The SDSRV ALOG today includes information that permits an operator to associate log entries with a specific request and identify the rpcID of that request. In cases where a PDS request encounters a problem in the SDSRV, operators can use the ALOG entries to trace the ACQUIRE request back to the original user request ID.
DDIST today has a mechanism to recognize PDPS requests. It will use this to force FTP Pushes to the PDS host to occur via the HiPPI at sites where such a connection exists. This re-uses logic DDIST applies today to force the FTP to PDPS to occur via the HiPPI.
After the data requested by PDS have been pushed to the PDS host, DDIST will generate a DN and send it to the e-mail address specified in the PDS data order. A PDS component will scan this e-mail address for new messages and let PDS know that the data is staged (or that the staging failed).
DDIST currently has special logic to recognize a request for Landsat data and will send a DN to DORRAN, in addition to the one sent by the user. This DDIST logic will be changed to suppress this DORRAN DN for PDS requests. DDIST will continue to send a DN to DORRAN for Landsat data requests that do not originate with the PDS. Note that the PDS will generate all DN for the physical media user orders.
On a regular basis (e.g., every 5 minutes), the PDS will check its order database for order completions and certain TBD order status changes that are not yet reflected in the ECS MSS database. The PDS will obtain the ECS Request ID of these orders from the PDS order database and update the corresponding request in the ECS order tracking database to a matching status.

**Development Capability (ies):**

| Cap ID | Title | Description | Change Date |
|---|---|---|---|

**Level 3 Requirement(s):**

| L3 ID | L3 Text | Clarification | Category | Release | CCR Num |
|---|---|---|---|---|---|
| DADS2490 | The ECS shall have the capability to distribute data on the following approved high density storage media:<br>a. 8 mm tape<br>b. CD-R<br>c. DLT<br>d. D3 tape<br>e. DVD-R | Pre-5B: 8mm<br>5BX: CD-R, DLT, DVD-R<br>6A: D3, CD-R, DLT, DVD-R | NO DATA | 6A Partial | 00-0265 |

| | | | | | |
|---|---|---|---|---|---|
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**IRD Requirement(s):**

*NONE*

**Level 4 Requirement(s):**

| L4 ID | L4 Text | Release | |
|---|---|---|---|
| S-CLS-nnnnn | The ODFRM CI shall not offer physical media distributions (i.e., other than FTP Push and FTP Pull). | 5BX | |
| S-DMS-nnnnn | The GTWAY CI shall send requests for physical media distributions that it would normally submit to the SDSRV as Product Request messages to the PDS. | | |
| S-DMS-nnnnn | The GTWAY CI shall accept Product Result messages for physical media requests that it forwarded to the PDS. | | |
| S-DMS-nnnnn | The GTWAY CI shall use the DORRAN formats and protocols specified in the ECS-EDC Interface Control Document ICD 423-41-58 for the product request and product response. | | |
| S-DMS-nnnnn | The GTWAY CI shall include CD-ROM, DLT, and DVD in the physical media distribution options of the V0 ODL messages it sends to the EDG. | | |
| S-CSS-nnnnn | The SBSRV GUI shall not offer physical media as a distribution option. | | |
| S-DSS-nnnnn | The SDSRV Command Line Interface shall accept FTP Push distribution requests and associated parameters FTPUSER, FTPPASSWORD, FTPHOST, FTPPUSHDEST. | | |
| S-DSS-nnnnn | The SDSRV Command Line Interface shall include the FTP Push parameters in the ACQUIRE request it submits to the SDSRV. | | |
| S-DSS-nnnnn | The SDSRV Command Line Interface shall accept an ECSUSERPROFILE parameter. | | |
| S-DSS-nnnnn | The SDSRV Command Line Interface shall include the ECSUSERPROFILE parameter in the SDSRV ACQUIRE request it submits. | | |
| S-DSS-nnnnn | The SDSRV Command Line Interface shall accept a PRIORITY parameter. | | |
| S-DSS-nnnnn | The SDSRV Command Line Interface shall include the PRIORITY parameter in the SDSRV ACQUIRE request it submits.. | | |
| S-DSS-nnnnn | The SDSRV Command Line Interface shall accept an | | |

| | | | |
|---|---|---|---|
| | USERSTRING parameter. | | |
| S-DSS-nnnnn | The SDSRV Command Line Interface shall include the USERSTRING parameter in the SDSRV ACQUIRE request it submits. | | |
| S-DSS-nnnnn | The SDSRV Command Line Interface shall accept an DDISTNOTIFYTYPE and a NOTIFY parameter. | | |
| S-DSS-nnnnn | The SDSRV Command Line Interface shall include the DDISTNOTIFYTYPE and a NOTIFY parameters in the SDSRV ACQUIRE request it submits. | | |
| S-DSS-nnnnn | The SDSRV Command Line Interface shall accept a tag parameter. | | |
| S-DSS-nnnnn | The SDSRV Command Line Interface shall use the tag parameter to generate an rpcID for the SDSRV ACQUIRE request it submits. | | |
| S-DSS-nnnnn | The SDSRV Command Line Interface shall accept a list of up to 100 granule identifiers that represent the granules to be acquired. | | |
| S-DSS-nnnnn | The SDSRV Command Line Interface shall accept granule identifiers specified in V0/DORRAN format (example: "SC:L70RWRS.001:2000022933"). | | |
| S-DSS-nnnnn | The SDSRV Command Line Interface shall submit an ACQUIRE command for the identified granules. | | |
| S-DSS-nnnnn | The SDSRV Command Line Interface shall accept aLandsat floating scene request and its associated subsetting parameters, for a single granule per request. | | |
| S-DSS-nnnnn | Upon receipt of a Landsat floating scene request, the SDSRV Command Line Interface shall submit a corresponding Landsat floating scene subsetting request to the SDSRV. | | |
| S-DSS-nnnnn | The SDSRV Command Line Interface shall be able to accept requests from multiple PDS instances that may employ different user profiles. | | |
| S-DSS-nnnnn | The SDSRV Command Line Interface shall be able to accept requests for a designated mode. | | |
| S-DSS-nnnnn | It shall be possible to submit requests in a given mode via the SDSRV Command Line Interface concurrently. | | |
| S-DSS-nnnnn | The number of requests that can be submitted in a given mode via the SDSRV Command Line Interface concurrently shall only be limited by SDSRV constraints, and not by constraints inherent in the SDSRV Command Line interface design. | | |
| S-DSS-nnnnn | It shall be possible to submit requests via the SDSRV Command Line Interface in several different modes concurrently. | | |
| S-DSS-nnnnn | The DDIST CI shall be able to display the USERSTRING parameter of an ACQUIRE command on the DDIST GUI | | |
| S-DSS-nnnnn | The DDIST CI shall be able to recognize PDS requests based on a configurable lead-in string. (for example, if the configured string is “$PDS”, then a request associated with a user profile ID “$PDS01” would be recognized as a PDS request). | | |

| | | | |
|---|---|---|---|
| S-DSS-nnnnn | The DDIST CI shall cause PDS FTP Push requests to be distributed via HiPPI at sites where a HiPPI connection to the PDS staging area is available. | | |
| S-DSS-nnnnn | The DDIST CI shall cause PDS FTP Push requests to be distributed via the internal (i.e., drg-resident) ftp distribution server. | | |
| S-DSS-nnnnn | The DDIST CI shall suppress the DORRAN DN it currently sends for Landsat data requests if the request is a PDS request | | |
| | | | |
| S-DSS-nnnnn | The DDIST CI shall use the NOTIFY parameter of the ACQUIRE request (if specified) as the target for a DN or Failed DN if the distribution request is not associated with a Request ID. | | |

**L4 to L3 Mappings:**

| L4 ID | L3 ID | CCR Num |
|---|---|---|

**L4 to IRD Mappings:**

*NONE*

**Criteria:**

| Criteria Key | Criteria ID | Criteria Text | Type | CCR Num |
|---|---|---|---|---|
| | 10 | Verify that the ODFRM screens no longer offer physical media distribution options. | | |
| | 20 | Verify that the SBSRV screens no longer offer physical media distribution options. | | |
| | 30 | Submit search request messages in V0 ODL format to the V0 Gateway. Demonstrate that the V0 Gateway includes all physical media options (including 8mm, CD-ROM, DLT, and DVD) in its V0 Inventory Search Result Messages. | | |
| | 40 | Submit product requests for non-Landsat data in V0 ODL format to the V0 Gateway. The orders need to include FTP Push, FTP Pull, as well as several combinations of physical media. Using a simulation of the PDS interface, demonstrate that the V0 Gateway will generate and send product requests for physical media that meet the DORRAN format and protocol specifications in ICD 423-41-58; and that it will accept the corresponding product result messages. | | |
| | 50 | Submit product requests for Landsat fixed scenes and floating scenes in V0 ODL format to the V0 Gateway. The orders need to include FTP Push, FTP Pull, as well as several combinations of physical media. Using a simulation of the DORRAN and PDS interfaces, demonstrate that the V0 Gateway will forward all such requests in accordance with DORRAN interface | | |

| | | | | |
|---|---|---|---|---|
| | | specifications (ICD 423-41-58); and that for the physical media requests looped back to it as coming from DORRAN (ICD 423-41-58), it generates and sends product requests for physical media that meet the DORRAN format and protocol specifications in ICD 423-41-58 to the simulated PDS interface; and that it will accept the corresponding product result messages.. | | |
| | 50 | Use the SCLI to submit FTP Push requests for individual granules whose identifiers are specified in V0/DORRAN format. The requests must include non-Landsat granules and Landsat fixed scenes. The FTP Push requests must specify the FTP parameters, DDISTMEDIATYPE, DDISTMEDIAFMT, DDISTNOTIFYTYPE = MAIL, the NOTIFY parameter, PRIORITY=LOW, USERSTRING, and ECSUSERPROFILE and a tag parameter. NOTIFY parameter must specific a unique e-mail address reserved for this test. ECSUSERPROFILE parameter must specify the user profile created for this test and representing the PDS. Demonstrate the following<br>1. The requests submitted to ECS match the requests received via the SCLI.<br>2. The requests are correctly processed.<br>3. Distribution Notices (DN) and Failed DN are sent to the specified NOTIFY e-mail address.<br>4. The USERSTRING can be displayed on the DDIST GUI.<br>5. The USERSTRING appears in the DN and Failed DN.<br>6. OrderID and RequestID in the DN and Failed DN are set to NONE.<br>7. The DN and Failed DN otherwise match the specifications in ICD 423-41-58.<br>8. If the requested data is Landsat data, no DORRAN DN is generated. | | |
| | 60 | Use the SCLI to submit FTP Push requests for Landsat floating scenes, using various combinations of Band and spatial subsetting parameters. Demonstrate the following:<br>1. The requests submitted to ECS match the requests received via the SCLI.<br>2. The requested subsetting is performed.<br>3. The subsetted data is pushed as requested.<br>4. No DORRAN DN is generated. | | |
| | 70 | Use the SCLI to submit an FTP Push request for 100 non-Landsat granules. Verify the following:<br>1. The requests submitted to ECS match the requests received via the SCLI.<br>2. The requests are correctly processed. | | |
| | 80 | Submit ten requests concurrently via the SCLI in the same mode. Verify that the requests are correctly accepted and queued in distribution. | | |

| | | | | |
|---|---|---|---|---|
| | 90 | Submit two concurrent fixed scene FTP Push requests via the V0 Gateway, each using a different PDS user profile ID and e-mail address. Verify the following:<br>1. The requests are correctly executed<br>2. The correct user IDs are displayed.<br>3. The DN are sent to the respective e-mail addresses.<br>4. The DORRAN DN is suppressed in both cases.<br>5. The MSS request is not updated to "Shipped". | | |
| | 100 | Submit concurrent requests via the SCLI in the two different modes. Use different target directories for the different modes. Verify that the requests are correctly accepted and queued in the respective distribution mode. | | |
| | 110 | Submit a requests via the SCLI. After successful submission, re-submit the request using the same tag. Verify that the request is executed only once. | | |
| | 120 | Submit several requests via the SCLI, and the course of this, bounce the SDSRV. Resubmit any requests that failed or that timed out with the same tag that was used on their original submission (repeat the test until there is at least one such request). Verify that the requests are executed once and only once. | | |

**Test Case(s):**

| Criteria Key | Criteria Type | Test Case ID | Test Case Title | TC CCR Num | TC to CRIT CCR Num |
|---|---|---|---|---|---|
| | | | | | |

# Appendix D. Product Distribution System (PDS) Procedures used by Level 1 Operations at EDC

***EROS Data Center***

***U.S. Geological Survey***

**Information Technology Department**

**Computer Services Branch**

**Mundt Federal Building**

**Sioux Falls, SD 57198-001**

**Internal Procedure**

| | |
|---|---|
| **Title:** | PDS Operations |
| **Procedure No:** | IT-5062 |
| **Issue:** | 0 |
| **Effective Date:** | Sept. 9, 1999 |

**Responsible Official:** Computer Operations II Technical Area Leader

**Review Process:** The Responsible Official shall review this procedure annually and indicate the completed review process in the Computer Operations #2 Review Log.

**Table of Contents**

**1.0 Scope.**

**1.1** This procedure defines Product Distribution System (PDS) by Level 1 Operations. The procedure instructs Operators on login, startups, using the PDS online help feature, creation of products, monitoring, shutdown and anomaly recovery of the PDS system. For more detailed information, use the PDS on-line help feature.

The PDS is the interface between the Landsat Product Distribution System (LPDS) for instructions and the Landsat Product Generation System (LPGS) for the Level 1 product files. Customer products are offered on CD-ROM, 8mm high-density tape, or FTP (File Transfer Protocol). Any request to promote or cancel a request will be initiated by Customer Services (refer to **IT-5002**, **Level 1 Product Promotion/ Cancellation**).

**2.0 PDS Operations.**

**2.1 PDS Login.**

**2.1.1** At the **EDCLPGS06** X-terminal, boot from the **EDCLPDS01** host.
At the login display:
ENTER: **pds**
ENTER: **<password>** (will display both a desktop and a UNIX window).
ENTER: **setenv DISPLAY <IP# of x-term>** (or use alias **x<X-term #>**, i.e., **x2**).

**2.2 Initiating the Graphic User Interface (GUI) from the UNIX window.**

**2.2.1** At the UNIX window:
ENTER: **pdsoi** (The PDS Monitor screen appears.
Click on the **PDS Machine** box and select **lpds01_ops**. At the **Console ID** box, click in the box and type **pds** (press enter to commit selection).
A selection criteria window appears.
Select **ALL** on **Priority**, **Production Media**, **Due Date**, and for **Product Code select all L7 media types (L7-R, L77A, L7GH, L7GT)**. Select to sort by **Job Key** first to ensure all orders are in numeric sequence.
Click on **EXECUTE**. This is the standard startup for the PDS Operator Interface (OI), although other filtering or sorting options are available for use.

**2.3 Initiating the PDS Job Monitor.**

**2.3.1** Click on the desktop pulldown and select **Open UNIX shell**. Login as PDS.
ENTER: **pds**
ENTER: **<password>**
ENTER: **setenv DISPLAY <IP# of X-terminal>** (or use alias **x<X-term #>**, i.e., x2).
ENTER: **jobmonitor &**
A window will appear that indicates processing information and Rimage status.
ENTER: For Auto Rimage click the button called
Toggle AutoRimage this will enable you to activate
An order and let the system pick the Rimage it want's
To go to.

## 2.4 On-line Help Feature.

**2.4.1** From the PDS GUI menu, click on **Help** and **On_Form**. A Netscape window should appear with an overview of documentation useful for operations in PDS.

## 2.5 Monitoring Product Information.

**2.5.1** Product requests in the state of PDR_GEN on LPGS will automatically appear in the PDS Main screen with a status of **Pending**. The **Job Key** column will contain the order number and the units will be specified under the **Total Units** column. (Keep in mind all the units of a specific order may not instantly appear in the **Total Units** column; these may need to be checked for added units). The type of media requested is shown in the **Media** column.

The following color codes will aid Ops in monitoring product request status:

**Grey**: Pending (can be activated).

**Green**: Active (running to create output).
**Yellow**: QC_Hold (output created, ready to verify).
**Red**: Error (problem with product request, Ops will investigate).

**2.6 Creating Customer Products.** Instructions on operation of the Rimage CD writers are found in **IT-2063**, **Rimage Perfect Image Producer**.

**2.6.1** From the PDS OI:
Click the button to the left of the **Product Request** to be activated. A menu box will appear.
Click on **Activate** and click **OK** to confirm selection.
Job status will change from grey to green.
Once the product data is pulled from LPGS to PDS, a **Media Selection** window will appear for 8mm and/or CD products.

**2.6.2** Click on the **Output Device** of choice and click **OK** when the device is ready. A tape label will be printed for 8mm products on the label printer. This will occur after the device is issued. After the tape, CD, or ftp product is produced, a summary will print at **edclpdsp1**. A jewel case insert will print on **edclpdsp2** for CD products.

**2.6.3** After the output is generated, the PDS job status will change from **ACTIVE** to **QC_Hold** and colors change from green to yellow.

**2.6.4** The output is now ready to verify. Refer to **IT-5001**, **Level 1 Output Media Verification** for media handling and verification. When the verification is completed, the product request can be completed by clicking the left hand button and clicking on **COMPLETE**. Click **OK** to confirm selection. The Operator completing the order will date and initial the summary. Summaries are filed in monthly binders. Ops will deliver completed units to Dissemination at 09:30 and 13:30 each working day.

**2.7 Exiting the PDS GUI and logging off PDS and PDSSUP.**

**2.7.1** Select Shutdown on the **PDS Display** window. A confirmation window will appear. Select **YES** to shutdown or **CANCEL** to cancel the action.

**2.7.2** Type **exit** to exit a UNIX window.

**2.7.3** Click on the desktop pull down menu and select **Log Out** to logoff the X-terminal.

**3.0 Anomaly Recovery.**

**3.1 Initiating the PDSSUP Account.**

**3.1.1** Click the desktop pulldown and select **Open UNIX shell**.
ENTER: **login pds**
ENTER: **<password>**

ENTER: **setenv DISPLAY <IP # of x-term used>** (or use alias **x<X-term #>**, i.e., x2).
ENTER: **pdsqmgr**
A window will appear
ENTER: USER Name **ops**
ENTER: <password>
A window will appear called **PDS Main Menu** with a variety of options. (This is the maintenance module and in normal operations, supervisor functions will only be conducted by staff with supervisor privileges).

### 3.2 Reprocessing in PDS.

3.2.1 If processing of an order will not complete (QC-Hold) or Error out (Error), the following steps should be followed to reprocess:

From the PDS account in the **~PDS** directory:
ENTER: **ls**.
ENTER: **rm order#_unit#.ppf**.
ENTER: **rm EDCLPDS01_pds_order#_unit#.status**.
ENTER: **cd assemble**.
ENTER: **rm -r order#_unit#**.
ENTER: **rm order#_unit#.image**.

The status of the order will need to be changed from **I** (in progress) to either **F** (QC-Hold) or **Q** (Pending) to reprocess the order. This will be accomplished from the PDSSUP OI.

Click on the **PDSINFO Work Table** button. Populate the **Job Key** field with the job key number as noted in the PDS OI.
Click on the **Execute Query** button. Using the arrows at the bottom of the OI, scroll through until the unit **NBR** field is populated with the unit number of interest.
Change the status field from **I** to **F** or **Q** and click on **Save**.
Click on **Exit** to return to the PDSSUP OI and proceed with the order as needed.

### 3.3 Changing Media Type

**3.3.1** If a order needs to be changed from the media type that it was originally set to you need to run the following steps below:

From the PDSSUP Account in the **~PDS** directory
**CLICK:** The PDSINFO Jobs Table
**ENTER:** JobKey # (From PDS OI)
**CLICK:** Execute
**(Any Changes made in this screen will affect all units under that JOBKEY)**
Change the product media and status field as needed
**CLICK:** Save
**CLICK:** Exit
At the main screen you will then need to enter into the
PDSINFO Work Table
**ENTER:** The Job Key **(from the pdsoi)** that you wish to change.
**Then click on execute query**.
**(Be certain that the unit # field is populated with the unit # of interest).**
Change the status, product media, output specs, and copy
Fields as needed.
**CLICK:** Save
**CLICK:** Exit
**Note that all the order numbers and unit numbers will need to be changed back at the end before they are completed To do this function take over from step 3.3.1**

**4.1 GUI: Graphic User Interface.**

**LPGS: Level I Product Generation System.**

**PDS: Product Distribution System.**

**DORRAN: Distributed Ordering Research Reporting And Accounting Network.**

**ECS: EOSDIS Core System.**

**L0R: Level 0 Reformatted.**

**OI: Operator Interface.**

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# Appendix E. ECS - PDS Integration for ECS

## ECS - PDS Integration for ECS

Version 1.3, 10/26/2000

This document describes the approach that was selected for integrating the EDC Product Distribution System (PDS) with 5B ECS. The intent is to use the PDS for all hard media distributions (except D3) because the ECS upgrade for new media types (CD, DLT, etc) is delayed.
During a telephone conference between ESDIS, EDC, and ECS on 10/25/00, it was decided to pursue the option previously known as the FRONTEND option. The operational scenario was refined in a number of places. These decisions are reflected in the description below. This document does not cover any changes to PDS needed to package it up as a product that can be delivered to and operated by other DAAC.
A brief explanation of the changes and impact needed to carry the 5B integration approach into 6A has been added (Section 3).

## Ops Concepts

## Non Landsat Products

The ECS V0 GTWAY currently sends all Landsat requests to DORRAN after first creating ECS MSS order tracking information. For the ECS-PDS integration, the V0 GTWAY will be modified to forward media requests other than FTP Push, FTP Pull, and D3 (i.e., 8mm, DLT, CD-ROM) to a new PDS Input Server (PDSIS), again after creating the ECS MSS order tracking information. The interface will be socket based and use the same ODL message formats as the DORRAN interface. The forwarded requests will include the original order ID and request ID, UR of the granules to be ordered, the shipping and contact information, and the media options (it would not include granule/order size). Note that the status of the ECS order and request are NULL at this point.
The PDSIS parses the ODL and inserts the request into the PDS Oracle database table. When ready to process the order, PDS obtains the data from ECS, generates the media, and maintains order tracking status in its Oracle database table.
The ordered data and .met files are staged via FTP Push to a PDS staging area. To accomplish this, PDS will submit an FTP Push ACQUIRE request using the ECS CLI (e.g., this might be a new module in PDS to handle ECS as a data source). PDS will provide the FTP Push parameters, such as host, account, password, and directory. The directories might be pre-existing or created by PDS when the request is submitted. PDS will pace CLI requests to prevent the staging area from overflowing while at the same time trying to keep the distribution system busy.
PDS will specify a user profile reserved for PDS use in the CLI parameters. ECS operators then can readily identify PDS orders.
PDS will specify an e-mail notification address in the CLI parameters that is reserved for distribution notifications to the PDS. ECS Distribution (DDIST) will use that e-mail address for all Distribution Notices (DN) or Failed DN it generates for PDS submitted requests.
The PDS will include the original RequestID into the UserString parameter of the CLI. The UserString will appear in all DN / Failed DN that ECS creates for PDS requests. It can be used by operations to correlate a DN with the original request, should that prove necessary.
To support recovery, the PDS uses a unique CLI request ID (called CLI tag parameter)[1].
From an ECS perspective, the order submitted by the PDS via the CLI is separate from and unconnected with the original user order that was forwarded to the PDS by the GTWAY. The CLI ACQUIRE is handled by ECS independently of the original user order. The CLI will not create ECS order and request tracking information in the ECS MSS database.

[1] For example, if PDS were to submit an order and not receive a response, it could simply retry submitting it. When it eventually gets into ECS, ECS will check whether the order already exists and ignore the re-submission.

To address this situation, DDIST is modified to display an additional attribute on its operator screens. The intent is to permit operators to determine the ID of the original user request. Possible attributes are the UserString and the CLI tag. However, DDIST is asked to propose an alternative attribute available in the ACQUIRE parameters if this would be cheaper to implement.
DDIST today has a mechanism to recognize PDPS requests. It uses this to force FTP Pushes to PDPS to occur via an FTP Push server that is connected to the HiPPI. DDIST will be modified to apply the same logic to PDS requests and route them through the same FTP Push server.
After the data requested by PDS have been pushed to the PDS host, DDIST will generate a DN and send it to the e-mail address specified in the PDS CLI request. A PDS component will scan this e-mail address for new messages and let PDS know that the data is staged (or that the staging failed).

A new, ECS provided Order Tracking Interface Script (OTIS) will be executed on a regular basis (e.g., every 5 minutes). It will check the PDS Oracle database for order completions whose status is not yet reflected in the ECS MSS database. The script will obtain the ECS Request ID of these orders from the PDS Oracle table and update the corresponding request in the ECS order tracking database to a matching status.

# Landsat Products

Landsat products are routed via DORRAN and thus require some special consideration. The operations concept for Landsat fixed scene orders will be as follows:

- The V0 GTWAY will separate requests for Landsat products from other requests and route them to DORRAN like today.
- Eventually, DORRAN will send the request back to the V0 GTWAY. GTWAY recognizes that this request is now coming from DORRAN because it contains a valid order ID and request ID lke today.
- In accordance with the above scenario, if the request is for FTP Pull, FTP Push or D3, it will be submitted to the Science Data Server. Otherwise, it will be routed to the PDSIS (same as above scenario).
- The PDS eventually will submit a CLI acquire for the requested Landsat data. SDSRV will perform the subsetting and pass the resulting files to DDIST for FTP Push distribution to the PDS (same as above scenario).
- DDIST currently has special logic to recognize Landsat requests and will send a DN to DORRAN, in addition to the one sent by the user. This DDIST logic will be changed to suppress the DORRAN DN for PDS requests. The normal DN would be sent as usual (to the PDS e-mail address specified in the acquire parameters). PDS requests can be recognized, for example, by their user ID or their e-mail notification address.

Landsat floating scenes need to follow a modified version of the above operations concept because the CLI does not handle subsetting parameters. For floating scenes, the scenario will be as follows:

- PDS or DORRAN (TBD by EDC) will convert a Landsat floating scene media distribution request into an FTP Push request and submit it to the V0 GTWAY (i.e., not via the CLI).
- The request will contain the original order and request ID so the V0 GTWAY knows that it need not be routed to DORRAN. Instead, the V0 GTWAY will submit it to the SDSRV. The subsetting operation will be performed and the result pushed by DDIST to the PDS host.
- The request will also contain the PDS User ID and e-mail address to ensure that it is recognized as PDS request and that the DN is routed to the correct e-mail address. When DDIST recognizes this as a PDS request , it will suppress the second notification intended for DORRAN (same as for fixed scenes).
- However, DDIST would on this occasion update the MSS order tracking status to “Shipped” since request ID and order ID are specified. DDIST logic will be modified to suppress this update when it recognizes PDS requests.

# Capabilities

The following is a summary of the capabilities that are needed to accomplish the ECS – PDS integration and implement the operational concepts.

# ECS Responsibility

1) **(DDM)** New OTIS script: Check the PDS Oracle database for order completions whose status is not yet reflected in the ECS MSS database. Obtain the ECS Request ID of these orders from the PDS Oracle table. Update the corresponding request in the ECS order tracking database to a matching status.
2) **(GTWAY)**: Forward media requests other than FTP Push, FTP Pull, and D3 (i.e., 8mm, DLT, CD-ROM) to a new PDS Input Server (PDSIS) after creating the ECS MSS order tracking information. The interface will be socket based and use the same ODL message formats as the DORRAN interface
3) **(GTWAY)**: Add new media types to the appropriate V0 GTWAY configuration file
4) **(CLS)** Disable distribution options other than FTP Pull and FTP Push
5) **(DDIST)** Display on the GUI an acquire parameter containing the ID of the original user request (DDIST is asked to propose that parameter; UserString and CLI tag are candidates).
6) **(DDIST)** Ensure that FTP Push to PDS is done via HiPPI (where available) similar to PDPS distributions. PDS requests can be recognized, for example, by their user ID or their e-mail notification address.
7) **(DDIST)** Suppress the DORRAN DN sent for Landsat requests if the request is a PDS request.
8) **(DDIST)** Suppress this update of the MSS order tracking status to"Shipped" for tracked PDS requests.
9) **(DAAC Ops)** Create a user account for use by PDS CLI orders.

ECS-PDS integration assumes a robust version of the CLI; that the CLI will support the mentioned ACQUIRE parameters; and that it will pass the CLI tag is passed to the SDSRV as a pre-assigned rpcID so ECS can recognize re-submission of acquire requests.

# PDS Responsibility

1) Receive media requests from the ECS V0 GTWAY via socket in ODL format. The interface will use the same message formats that are currently used by the ECS-DORRAN interface. Insert the request into the PDS Oracle Database. Save ECS request and order ID, granule UR, media options, shipping and contact information. Segment the request into PDS Units. PDSIS must be robust to recover from faults in GTWAY, PDSIS, Oracle.
2) For all requests except L7 floating scenes: Create and submit FTP Push requests for the needed data to ECS via the CLI. Specify a reserved ECS MSS UserID and a reserved e-mail notification address on that occasion. Use the CLI tag for recovery. Include the original Request ID in the CLI UserString parameter. Use a pre-existing directory or create a new directory. (It is suggested that operating mode be included in the path.). Provide the FTP Push parameters to the CLI.
3) For floating scene requests: Convert a Landsat floating scene media distribution request into an FTP Push request and submit it to the V0 GTWAY (i.e., not via the CLI). Include the original order and request ID. Include the PDS User ID and e-mail address
4) Pace CLI requests to prevent the staging area from overflowing while at the same time trying to keep the distribution system busy.
5) Scan a designated e-mail address for ECS DN and Failed DN. Alert PDS that the requested data has been staged (or failed to stage). Solution must be robust to handle recovery from failures.
6) Generate ECS DN after PDS completes the distribution.
7) Generate ECS Packing List after PDS completes the distribution.
8) Generate ECS Media Description File after PDS completes the distribution.
9) Split requests across media units and handle case where file does not fit on a single media unit.
10) The PDS may split large media distribution requests into several CLI requests.

ECS-PDS integration assumes that the PDS database will retain the ECS request ID and Order ID for access by the OTIS and that recently completed orders can be identified.

It is also assumed that the PDS will not break media distribution requests into individual CLI requests for each granule.

# 6A Option

The impact of using the FRONTEND solution for integrating PDS with ECS 6A was discussed in today's meeting between the ECS Development and Architects Office.

We concluded the following:

- 6Aand 5B base lines differ in some important aspects because the 6A baseline contains the support for the new media options and obtaining them from the Registry.
- 6A and 5B also have very different DDIST software base lines.
- We believe that the Registry implementation for media types does not support server specific media type configurations.

Though the scenarios will remain essentially the same in 6A as in 5B, the following capabilities would be new or require a substantially different implementation:

- **INFR**: The Registry interface needs to support the specification and retrieval of media options similar to how it handles other configuration parameters. The intent will be to specify FTP Push and FTP Pull as the generic media option configurations; and FTP Push, FTP Pull plus the hard media types specifically for the V0 GTWAY.
- **GTWAY**: Two options for implementing the GTWAY capabilities are under considerations.
  + The first and preferred alternative is to integrate the 6A GTWAY with 5B ECS. This would require some minor changes to stub out the Registry interface and read the distribution options from a file (similar to what the 5B version does).
  + The second alternative is to make the GTWAY changes to both the 5B and 6A versions of the GTWAY. The 5B version obtains the distribution options from a file; the 6A version obtains them from the registry. This option is less desirable because implementing the PDSIS interface is easier in 6A, and different from the manner in which it is implemented in 5B (i.e., requiring more development effort)
- **DDIST**: will need to re-implement the capabilities listed in Section 2.1 for its 6A baseline.
- **DDM**: The 5B version of the DDM OTIS script will not require changes to work with 6A.
- **CLS**: the 5B changes to ODFRM would not need to be transferred to 6A. The 6A version of the ODFRM will obtain the permitted distribution options from the (generic branch of the) registry.

# Appendix F. ECS PDS Risk Mitigation Table

| ECS PDS RISK MITIGATION | | | | |
|---|---|---|---|---|
| **RISK #** | **RISK ITEM** | **CURRENT RISK** | **MITIGATION** | **ACTION** |
| 1 | Timely and complete delivery of required hardware to EDC for burn in and configuration is critical to maintaining a reasonable schedule for installation and integration at the DAACs. | Medium | ECS by working with the Government has purchased hardware on a quick turnaround basis that will mitigate any risk associated with critical path hardware delivery requirements. ECS will continue to work with ESDIS and the hardware contractors to ensure timely deliveries of hardware to EDC. Hardware requirements to meet ECS PDS schedule commitments will be tracked and reported on a weekly basis until all ECS PDS development hardware issues are resolved. EDAAC and GSFC hardware delivered. | ECS action to purchase LaRC and NSIDC Hardware. |
| 2 | Ability to obtain timely agreement on interface and requirements/specification issues included in Interface Control Documentation and Requirement Specification Documentation. | Low | EDAAC and ECS will continues to work with the component points of contact to finalize the ECS PDS interfaces. The interface and requirements documentation will be configuration managed in a strict CM environment to insure proper software coding and integration. The interface and requirements documents are a major driver to the project schedule and will be followed to completion by the project leads. At this point in time, all the interface and design issues related to the documentation are well within program schedule requirements and associated risk is very low. | Document finalization 1/9/01 |

## ECS PDS RISK MITIGATION

| RISK # | RISK ITEM | CURRENT RISK | MITIGATION | ACTION |
|---|---|---|---|---|
| 3 | Risk of distribution requiring computer resources over and beyond the ECS contract baseline impacting the effectiveness of the operational systems at the DAACs. | Low | ECS and ECS DAACs will continue distribution during the development and IOC to determine if additional resources are needed. The ECS PDS system has the capability to handle more than the current distribution requirement, if more staging disk are required, the ECS PDS design can easily accommodate additional disks. | Based on current distribution requirements, monitoring for future drop is all that is needed here. |
| 4 | Concern about development resources being available to meet the integration phase of the ECS PDS components. | Low | This is considered low risk due to the fact that there are currently preliminary versions for 2 of the current TEs with follow-on pre-integration TEs and final TEs already planned and being worked at ECS. Also PDSIS and PDS-SA are being tested in conjunction with ECS TEs during development. | Project Management follow the integration testing at EDAAC. |
| 5 | Ability to maintain required staffing skill mix for delivering ECS PDS release capabilities. | Medium | ESDIS and ECS have committed to providing ECS resources from the development facilities and the DAACs to support system integration and test. With approval and coordination of resources and appropriate planning, integration and test at the DAAC s should be a minor risk. | DAACs need to buy into the ECS PDS schedule. |
| 6 | The risk that the selected architecture may not satisfy the Fail over requirement and additional material may be needed. (RMA). | Low | ECS is performing an assessment of RMA for its systems at the DAACs and is planning to perform a more accurate assessment of RMA at Release 6B. If necessary, the H/W configuration will be supplemented. The RMA of the PDS system at the EDC is very reliable and can support numbers consistent with the ECS requirements. | ECS RMA assessment. |

| ECS PDS RISK MITIGATION | | | | |
|---|---|---|---|---|
| **RISK #** | **RISK ITEM** | **CURRENT RISK** | **MITIGATION** | **ACTION** |
| 7 | The risk that the DAAC facilities will not be ready with power and space to support ECS PDS integration. | High | This item is a critical path item that has been a problem in the past. However, early development visits to each of the facilities and preliminary documentation has been provided to the DAAC s to allow necessary requirements to be analyzed and the long lead items to be put into motion. The risk is considered high because the program has no control over the DAAC facilities and without facilities ECS PDS cannot complete schedule requirements. | Track power and space for PDS at the DAACs. |
| 8 | Concern about unpredictability of COTS vendors upgrading or changing their products affecting the ECS PDS system. | Low | ECS continues its aggressive policy to obtain timely information from vendors regarding their product changes and planning/updating ECS's activities based on criticality of these changes. Additionally, ECS continues its negotiation strategy with its vendors pursing extended product support agreements if necessary. The near term issues here are minimal all software compatibility issues that are currently known are being addressed via testing with fall back to an older version is acceptable to meet current program needs; therefore, the risk is considered low. However, there has been some concern over the support of Oracle on the SGI in the future. This could become a potential follow –on risk that needs to be tracked. (Oracle 8i with Developer 4.5 or 6.0 compatibility – study underway, no fatal issues to date) | COTS team needs to review for future. |

## ECS PDS RISK MITIGATION

| RISK # | RISK ITEM | CURRENT RISK | MITIGATION | ACTION |
|---|---|---|---|---|
| 9 | ECS and DAAC support resources will require key development expertise for maintenance and follow-up. | Low | EDAAC will maintain a technical support staff for approximately 1 year through 4th QFY01 to minimizes technical issues. ECS PDS will be using delivered ECS code and using standard troubleshooting processes further reducing this risk. System and Operator training will be provided prior to operational release. EDC currently uses a PDS system with very few issues, and a high stability. Therefore; this concern is valid but considered to be a very low risk. | Current ECS sustainment process will work. |
| 10 | Ability to transition from current media distribution to ECS PDS with minimal system downtime impacting the operational environment. | Low | The ECS PDS can be tested in the test modes to minimize downtime associated with integration into the operations modes at the DAACs. Also the current ECS distribution system can continue to work until full switch over to the ECS PDS has been accomplished. | N/A |
| 11 | EDAAC development resources required to complete development are limited. | Medium | EDAAC has developed a risk migration plan associated with this issue by having a support contract in place to allow for project growth, and program slip, if needed. Current risk is medium due to learn to time associated with back up personnel in a short program time window. | EDAAC providing Overtime to key developers and monitoring progress closely. |
| 12 | The use of new DVD technology within the ECS PDS. | Medium | EDC has done some testing of the DVD technology and has an on-going development and implementation project underway. The risk of incorporating DVD in the phase 1 ECS PDS by the first part of March is in the medium risk category. However, the risk is low that DVD would be available by the first part of April for integration and test. | EDAAC currently testing DVD with PDS; the risk is being mitigated. |

## ECS PDS RISK MITIGATION

| RISK # | RISK ITEM | CURRENT RISK | MITIGATION | ACTION |
|---|---|---|---|---|
| 13 | NASA ESDIS and ECS developer have on-going action to limit appropriate media selection at the time of order via the client. This will not be available initially. | Medium | PDS supports Super-User concept of "revising" media choice and/or cancel. ECS Distribution Operators will intercede and coordinate order recovery action via ECS procedure (out of scope). This will become a much bigger issue as we go to B&A (EDC B&A is planned for 10/01/01). | ESDIS/DAAC |
| 14 | Out-year sustainment and maintenance after delivery | Low | This is a low risk item due to the fact that ECS sustainment can happen easily with the current ECS code sustainment process, and EDAAC development support can be tied into the help desk during the interim (ECS with small on-going FY01 tech consult). | ECS M&O evaluate current process to ensure support. |
| 15 | Order/Media Metrics | Low | Metrics are out of scope, only logging is for trouble shooting. MSS will be updated with "minimum" information (i.e. status). | ECS: Provide input to ECS Dashboard. |
| 16 | Media for testing and operations | Low | The physical media for testing will be provided by ECS contract; however, the media is not available yet. The risk is low because media can be purchased and paid for via USGS to support program start up requirements, if necessary. | ECS:develop initial media buy. EDAAC: Develop MOA with DSB to obtain test media. |

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